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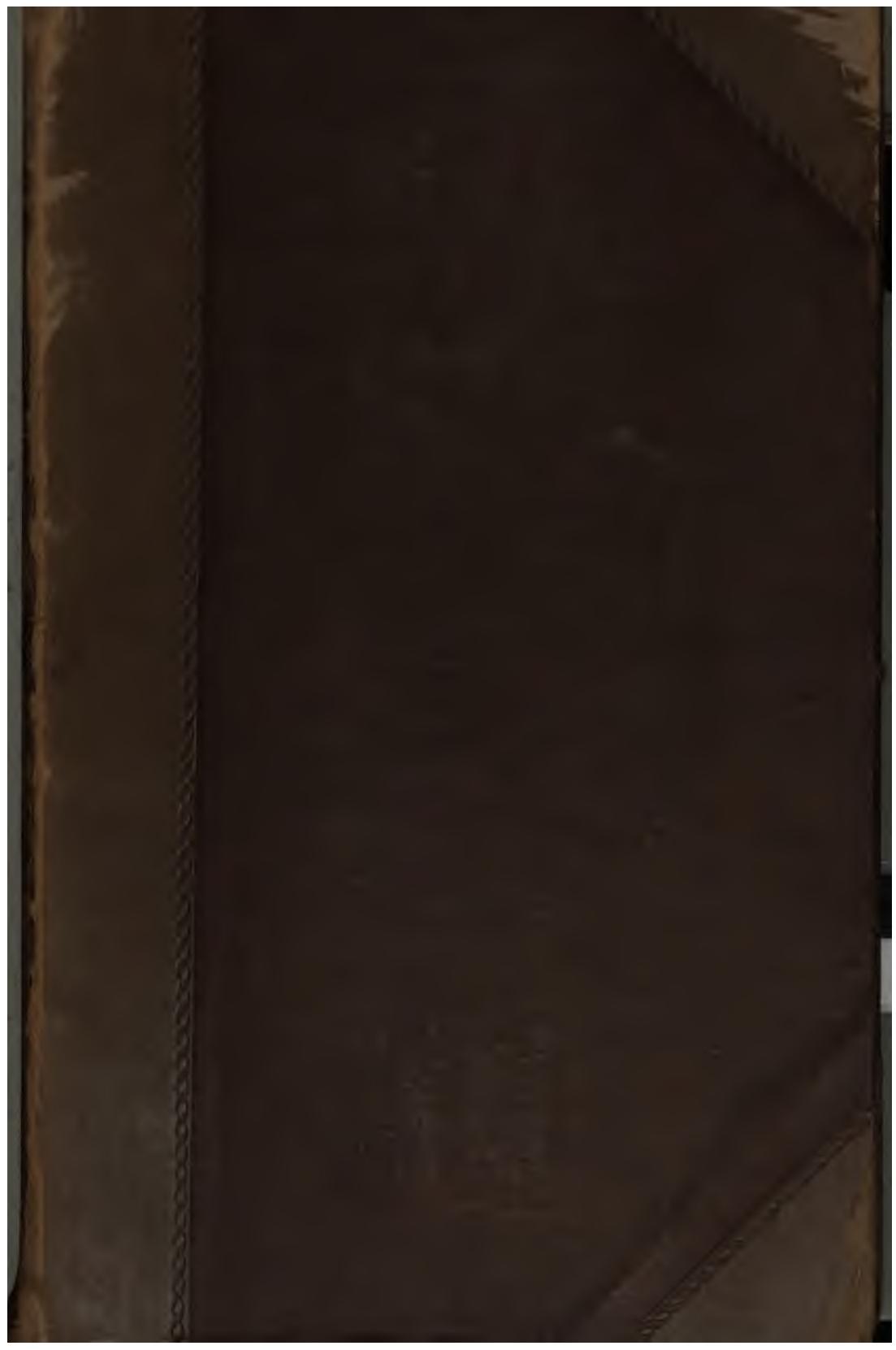
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GENERAL VIEW
OF THE
AGRICULTURE
OF THE
COUNTY OF WORCESTER;
WITH
OBSERVATIONS
ON THE MEANS OF ITS IMPROVEMENT;
PUBLISHED BY ORDER OF
THE BOARD OF AGRICULTURE
AND
INTERNAL IMPROVEMENT.

By W. PITTS,
FORMERLY OF PENDFORD, NOW OF BIRMINGHAM.

In Nature's bounty rich,
In herbs, and fruits, whatever greens the spring,
When Heaven descends in showers, or bends the bough,
When Summer reddens, and when Autumn beams,
Or blunting mountains, or the chiefe of streams.
* * * * *
The fragrant stores, the wide projected heaps
Of apples which the lusty-handed year,
Innumorous, o'er the blushing orchard shakas,
A various spirit, fresh, delicious, keen,
Dwell in their gelly pores, and active points,
The piercing cider for the thirsty tongue.

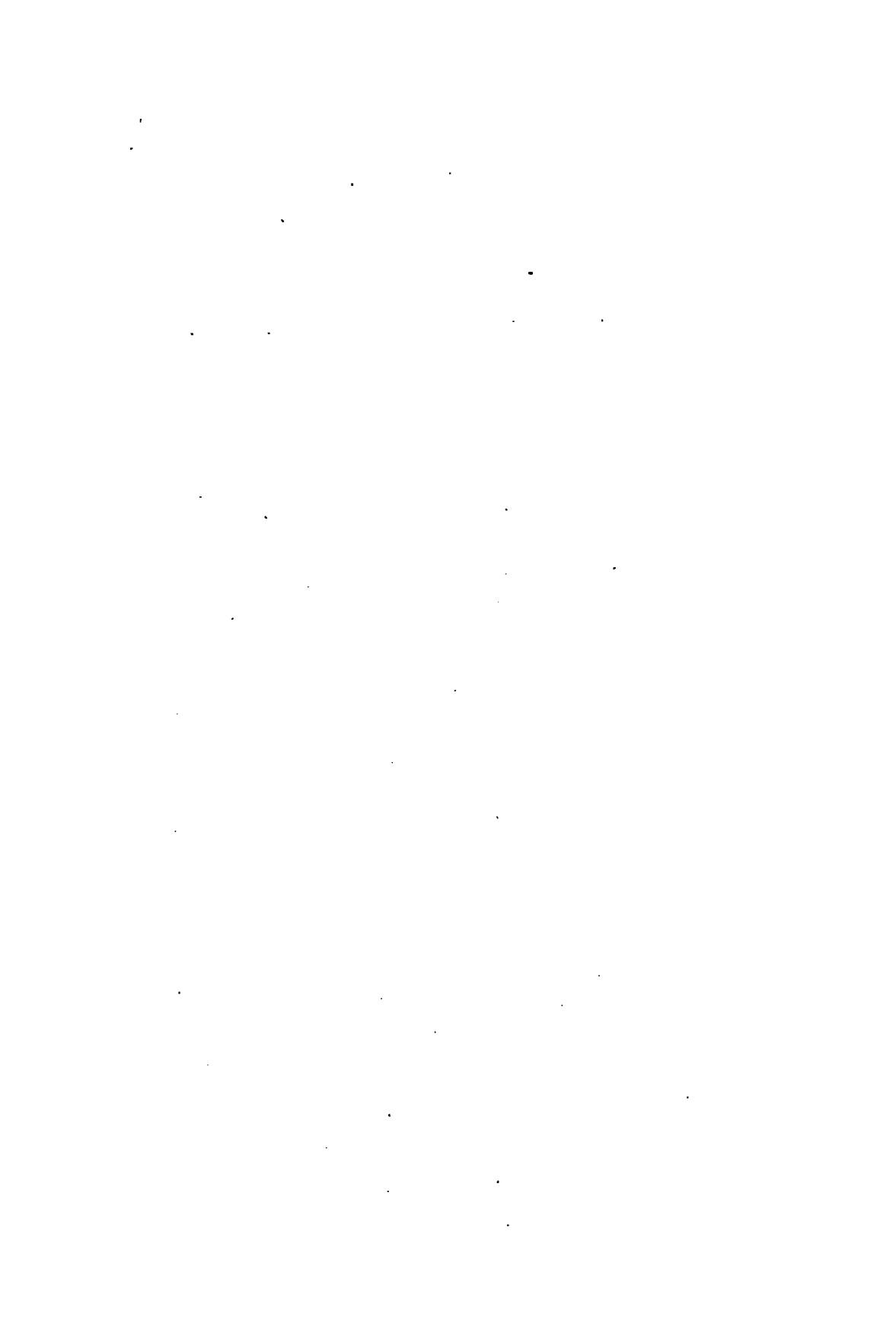
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1810.



ADVERTISEMENT.

THE great desire that has been very generally expressed for having the Agricultural Surveys of the Kingdom reprinted, with the additional communications which have been received since the original reports were circulated, has induced the Board of Agriculture to come to a resolution of reprinting such as may appear on the whole fit for publication. It is proper, at the same time, to add, that the Board does not consider itself responsible for any fact or observation contained in the Reports thus reprinted, as it is impossible to consider them yet in a perfect state ; and, that it will thankfully acknowledge any additional information which may still be communicated ; an invitation of which, it is hoped, many will avail themselves, as there is no circumstance from which any one

can

can derive more real satisfaction, than that of contributing, by every possible means, to promote the improvement of his country.

N. B. Letters to the Board may be addressed to Sir John Sinclair, Bart. M.P. the President, Sackville-street, London.

PLAN

PLAN
FOR REPRINTING THE
AGRICULTURAL SURVEYS,
BY THE
PRESIDENT of the BOARD of AGRICULTURE.

A BOARD established for the purpose of making every essential inquiry into the agricultural state, and the means of promoting the internal improvement, of a powerful empire, will necessarily have it in view, to examine the sources of public prosperity, in regard to various important particulars. Perhaps the following is the most natural order for carrying on such important investigations ; namely, to ascertain,

1. The riches to be obtained from the surface of the national territory.
2. The mineral or subterraneous treasures of which the country is possessed.
3. The wealth to be derived from its streams, rivers, canals, inland navigations, coasts, and fisheries : And,
4. The means of promoting the improvement of the people, in regard to their health, industry, and morals, founded on a statistical survey, or minute and careful inquiry, into the actual state of every parochial district in the kingdom, and the circumstances of its inhabitants.

Under one or other of these heads, every point of real importance, that can tend to promote the general happiness of a great nation, seems to be included.

Investigations of so extensive and so complicated a nature, must require, it is evident, a considerable space of time before they can be completed. Differing, indeed, in many respects from each other, it is better, perhaps, that they should be undertaken at different periods, and separately considered. Under that impression, the Board of Agriculture has hitherto directed its attention to the first point only, namely, the cultivation of the surface, and the resources to be derived from it.

That the facts, essential for such an investigation, might be collected with more celerity and advantage, a number of intelligent and respectable individuals were appointed, to furnish the Board with accounts of the state of husbandry, and the means of improving the different districts of the kingdom. The returns they sent were printed, and circulated by every means the Board of Agriculture could devise, in the districts to which they respectively related; and, in consequence of that circulation, a great mass of additional valuable information has been obtained. For the purpose of communicating that information to the public in general, the Board has resolved to publish the survey of each county, as soon as it is brought to a state fit for publication. When all these surveys shall have been thus reprinted, it will be attended with little difficulty to draw up an abstract of the whole (which will not probably exceed two or three volumes quarto) to be laid before his Majesty, and both Houses of Parliament; and afterwards a General Report on the present state of the country, and the means of its improvement, may be systematically arranged, according to the various subjects connected with agriculture. Thus every individual in the kingdom may have,

1. An account of the husbandry of his own particular county; or,
2. A general view of the agricultural state of the kingdom at large, according to the counties or districts into which it is divided; or,
3. An arranged system of information on agricultural subjects, whether accumulated by the Board since its establishment, or previously known;

And thus information respecting the state of the kingdom, and agricultural knowledge in general, will be attainable with every possible advantage.

In reprinting these Reports, it was judged necessary, that they should be drawn up according to one uniform model; and after fully considering the subject, the following form was pitched upon, as one that would include in it all the particulars which it was necessary to notice in an agricultural survey. As the other Reports will be reprinted in the same manner, the reader will thus be enabled to find out, at once, where any point is treated of, to which he may wish to direct his attention.

PLAN OF THE REPRINTED REPORTS.

PRELIMINARY OBSERVA- TIONS.	CHAP.
	II. STATE OF PROPERTY.
	SECT. 1.—Estates and their Management.
	2.—Tenures.
I. GEOGRAPHICAL STATE AND CIRCUMSTANCES	III. BUILDINGS.
SECT. I.—Situation and Ex- tent.	SECT. 1.—Houses of Pro- prietors.
2.—Divisions.	2.—Farm Houses and Offices; and Re- pairs.
3.—Climate.	3.—Cottages.
4.—Soil and Surface.	
5.—Minerals.	
6.—Water.	
	IV. MODE

CHAP.	CHAP.
IV. MODE OF OCCUPA-	VIII. GRASS.
TION.	SECT. 1.—Natural Meadows and Pastures.
SECT. 1.—Size of Farms—Character of the Farmers.	2.—Artificial Grasses
2.—Rent—in Money —in Kind—in Personal Services.	3.—Hay Harvest.
3.—Tithes.	4.—Feeding.
4.—Poor Rates.	
5.—Leases.	
6.—Expense and Profit.	
V. IMPLEMENTS.	
VI. INCLOSING—FENCES	IX. GARDENS AND OR-
—GATES.	CHARDS.
VII. ARABLE LAND.	X. WOODS AND PLAN-
SECT. 1.—Tillage.	TATIONS.
2.—Fallowing.	XI. WASTES.
3.—Rotation of Crops	XII. IMPROVEMENTS.
4.—Crops commonly cultivated; their Seed, Culture, Produce, &c.*	SECT. 1.—Draining.
5.—Crops not commonly cultivated.	2.—Paring & Burning
	3.—Manuring.
	4.—Weeding.
	5.—Watering.
	XIII. LIVE STOCK.
	SECT. 1.—Cattle.
	2.—Sheep.
	3.—Horses, and their Use in Husbandry, compared to Oxen.

* Where the quantity is considerable, the information respecting the crops commonly cultivated, may be arranged under the following heads:—

- | | | | |
|--------------------------|-----------------------|-------------------------------|--------------------------------|
| 1. Preparation. | { tillage.
manure. | 6. Culture whilst
growing. | { hoe,
weeding.
feeding. |
| 2. Sort. | | 7. Harvest. | |
| 3. Steeping. | | 8. Thrashing. | |
| 4. Seed (quantity sown.) | | 9. Produce. | |
| 5. Time of sowing. | | 10. Manufacture of Bread. | |

In general, the same heads will suit the following grains:—Barley, Oats, Beans, Rye, Pease, Buckwheat.

Vetches	- - Application.
Cole-seed	{ Feeding, Seed.
Turnips.	{ Drawn - - Fed - - - Kept on grass — in houses }

4.—Hogs.

CHAP.	CHAP.
4.—Hogs. 5.—Rabbits. 6.—Poultry. 7.—Pigeons. 8.—Bees. XIV. RURAL ECONOMY. SECT. 1.—Labour — Servants — Labourers—Hours of Labour. 2.—Provision. 3.—Fuel.	6.—Manufactures. 7.—Poor. 8.—Population. XVI. OBSTACLES TO IMPROVEMENT; INCLUDING GENERAL OBSERVATIONS ON AGRICULTURAL LEGISLATION AND POLICE. XVII. MISCELLANEOUS OBSERVATIONS. SECT. 1.—Agricultural Societies. 2.—Weights and Measures. CONCLUSION. Means of Improvement, and the Measures calculated for that Purpose. APPENDIX.
XV. POLITICAL ECONOMY, AS CONNECTED WITH, OR AFFECTING, AGRICULTURE. Sect. 1.—Roads. 2.—Canals. 3.—Fairs. 4.—Weekly Markets. 5.—Commerce.	

Perfection, in such enquiries, is not in the power of any body of men to obtain at once, whatever may be the extent of their views or the vigour of their exertions. If Lewis XIV. eager to have his kingdom known, and possessed of boundless power to effect it, failed so much in the attempt, that, of all the provinces in his kingdom, only one was so described as to secure the approbation of posterity ;* it will not be thought strange

* See Voltaire's *Age of Lewis XIV.* vol. ii. p. 127, 128, edit. 1752. The following extract from that work will explain the circumstance above alluded to.

" Lewis had no Colbert, nor Louvois, when about the year 1698, for the instruction of the Duke of Burgundy, he ordered each of the intendants to draw up a particular description of his province. By this means, an exact account of the kingdom might have been obtained, and a just enumeration of the inhabitants. It was an useful work, though all the intendants had not the capacity and attention of Monsieur de Lamoignon de Bavielle. Had, what the king directed, been as well executed in regard to every province, as it was by this magistrate

strange that a Board, possessed of means so extremely limited, should find it difficult to reach even that degree of perfection, which, perhaps, might have been attainable with more extensive powers: the candid reader cannot expect, in these Reports, more than a certain portion of useful information, so arranged as to render them a basis for further and more detailed enquiries. The attention of the intelligent cultivators of the kingdom, however, will doubtless be excited, and the minds of men in general, brought gradually to consider favourably of an undertaking which will enable all to contribute to the national stores of knowledge, upon topics so truly interesting as those which concern the agricultural interests of their country; interests which on just principles never can be improved, until the present state of the kingdom is fully known, and the means of its future improvement ascertained with minuteness and accuracy.

magistrate in the Account of Languedoc, the collection would have been one of the most valuable monuments of the age. Some of them are well done; but the plan was irregular and imperfect, because all the intendants were not restrained to one and the same. It were to be wished, that each of them had given, in columns, the number of inhabitants in each election; the nobles, the citizens, the labourers, the artisans, the mechanics, the cattle of every kind; the good, the indifferent, and the bad, lands; all the clergy, regular and secular, their reveues, those of the towns, and those of the communities.

" All these heads, in most of their accounts, are confused and imperfect; and it is frequently necessary to search with great care and pains, to find what is wanted; the design was excellent, and would have been of the greatest use, had it been executed with judgment and uniformity."

PRELIMINARY

PRELIMINARY OBSERVATIONS

TO THE

WORCESTERSHIRE REPRINTED REPORT.

THE original report of the agriculture of this county, was drawn up by Mr. Pomeroy, who took a survey of the county for that purpose in the year 1794; but as agriculture, as well as other human arts, and the productions of nature, are in continual fluctuation, and as different objects strike different observers, as well as the same objects in different points of view, I was desired to take a survey of the county in the year 1805, which was accordingly done, by visiting its particular parts, and examining it in various directions, as well as by procuring such personal information from others as could easily be obtained, which, together with the most material parts of Mr. Pomeroy's report, were incorporated together, and presented to the Board.

The productions of hops, and of fruit, both uncertain in their nature, and which form a peculiar characteristic of the county, having this year almost totally failed, little personal observation could be made on them; the writer has, however, availed himself of such information as could be obtained from others, respecting these articles, and hopes the account he has collected and given, may be acceptable to the public, and in some degree answer the expectation of the Board.

In

In 1807, by desire of the Board, I again made several excursions into the county, in different directions ; and the result of information then obtained is incorporated with the former matter, and the gentlemen, and other persons named, from whom I had the most valuable information.

To Mr. Carpenter, of Chadwick Manor, near Bromsgrove, author of an ingenious Treatise on Agriculture, I am much obliged for much valuable matter, as well as for attending me in an excursion round his neighbourhood ; to avoid repetition of a long name, when I have occasion to mention him in this Survey, I shall designate him by the term Mr. C.—To J. Knight, Esq. of Lea Castle, Wolverley, I am much obliged, for showing me his spirited cultivation ; and to others, whose names are mentioned in this Survey.

W. PITTS.

INTRODUCTORY

INTRODUCTORY OBSERVATIONS,

*Pointing out some Additional Measures, submitted to the
Consideration of the Board of Agriculture.*

BY SIR JOHN SINCLAIR, BART.

PRESIDENT OF THE BOARD.

NUMEROUS are the institutions, which, in this, and in many other countries, have been constituted, for the purpose of collecting information regarding various branches of human knowledge; but the Board of Agriculture, it is believed, is the first, either established by private individuals, or sanctioned by public authority, with a view, not only of collecting, but of digesting, the knowledge it has collected, and of forming it into a regular system for the general benefit of the public.

It is not to be wondered at, that such an attempt should not hitherto have been made, considering the great time, labour, and expense, which such an undertaking requires, if it is intended to be executed in a proper manner. For instance, before it was possible to give a just view of the agricultural state of Great Britain, it was necessary to have repeated surveys of the different counties, with funds very inadequate to such an attempt. From these surveys, which are at last on the eve of being completed, it is now proposed to draw up, under distinct heads, as Enclosures, Implements, Management of Grass Lands, Cattle, &c. the result of the whole enquiry. Nay, after a report on

any

any given subject, is prepared by some individual conversant in that particular department, it is indispensably necessary to submit his observations, in a printed state, to the examination of as many intelligent persons as possible, before a paper can ultimately be drawn up, in as complete a shape, and in every respect as perfect, as may be expected, if such a plan is judiciously carried into effect.

The Board of Agriculture having now carried on its enquiries for several years, it seemed to be full time that a specimen should be prepared of condensed information, regarding some important branch of agriculture; and the subject of Enclosures was proposed, as one of peculiar importance, to which the attention of the public had been often directed; respecting the advantage of which, a variety of opinions had been entertained; and which, if the Board could fully elucidate, would alone amply repay all the expenses which have been bestowed upon it. These sentiments having been approved of by the Board, the following paper was prepared by a very intelligent agriculturist, who seems to have done ample justice to the plan above suggested. What then may not be expected, when such a work undergoes the critical examination of a number of able men, who will be rewarded, in proportion to the value of the additional information transmitted by them. In the course of next year, it is to be hoped, that the result of the whole, will be laid before his Majesty, and both Houses of Parliament, and communicated to the public at large. Such a paper, formed with so much care and attention, ought to be considered as a species of code, or standard, regarding all points connected with enclosure; and indeed must set almost every question regarding it at rest. When
one

one subject is thus gone through, other branches connected with agriculture, will, from time to time, be explained, in a similar manner, and with equal care.

It will then appear, how essential it is for the public prosperity, to have all the information which a great nation can furnish, regarding any branch of useful enquiry, first collected, and then digested, into a regular system, so as to be easily accessible to all those, to whom the acquisition of such knowledge may be desirable.

Is it possible for the public money to be better bestowed, than in promoting such institutions, and effecting objects so essential for the general interest? The foundation of national prosperity must rest, on the knowledge possessed by individuals, of Agriculture, and all the other useful arts; and where, by public encouragement, that knowledge is in a double ratio extensively spread, a country must be doubly prosperous. Much, for that purpose, has been already effected by the exertions of the Board of Agriculture, in the great department over which it presides; but if the measures above recommended, were completed; if the principles of every branch connected with Husbandry, were thoroughly explained, and digested; and if, by judicious laws, all the most material obstacles to the improvement of the country, were removed; and if, in particular cases, even encouragement were given to promote great and useful exertions; the prosperity of the British Empire would increase with a rapidity beyond all former example, and even our present heavy burdens would scarcely be felt.

JOHN SINCLAIR.

Board of Agriculture,
1st Aug. 1807.

PRELIMINARY

PRELIMINARY OBSERVATIONS (CONTINUED),
1807.

SOME of the articles in this Survey, are treated of rather in a desultory manner, for which the writer hopes the following apology will be accepted: the materials were collected and registered at different times, and it was not in his power to incorporate them together, systematically, without recasting the whole, which leisure and other circumstances did not permit; and he has therefore been obliged, in some degree, to sacrifice method and order to perspicuity and matter of fact; he hopes, in its present form, it may be somewhat interesting and useful, and afford amusement, as well as information, to those not immediately acquainted with the county, as well as to those within it, who have not turned their thoughts to general subjects, or to things with which they were not particularly connected.

As botany has a more intimate connection with agriculture than is commonly supposed, and the spontaneous produce of any district is considerably indicative of the nature and qualities, as well as of the management, of the soil, I am unprepared, at present, to define and explain accurately such indications; but believe the subject to be highly worthy the attention of the botanist, and the philosophical and systematic agriculturist: thus rushes indicate that under, or hollow drainage, is wanted; goose tansey (*potentilla anserina*) shows a want of surface drains to let off stagnant water; the upland burnet, (*poterium sanguisorba officinalis*), denotes cold land and moist; chadlock and goulans, hard tillage; couch grasses the same, and bad management; the wild teasel, moist land; and the hare's foot trefoil, dry sand; and I have never seen the wild parsnip, the melilot,

lilot, or wild chicory, grow naturally in plenty and luxuriance, but upon good deep corn loams ; heath, (*erica*), denotes coldness and sterility ; gorse or furze, (*ulex*), thin barren gravel ; broom, (*spartium*), deeper and looser light gravel.

But agriculture has a still closer connection with botany, in the improvements to be effected by the cultivation of new and valuable plants, at present unknown and unnoticed by the farmer. It is very astonishing, that none of the natural grasses have been brought into general cultivation, except ray-grass, which is apparently far from being the best ; this neglect can only be accounted for from the tendency of the soil to produce such spontaneously ; or, from the ignorance and inattention of those interested. The better grasses should certainly be more generally tried in laying land to pasture, particularly the (*poa's*) meadow grasses, of which there are two or three good sorts ; also the vernal grass, the fox tail, the dog's tail, the timothy grass, and the rough cock's foot, (*dactylus*), also the upland burnet on dry calcareous soil ; lucerne on good loams, as well as chicory and melilot for pasture or hay ; also the perennial vetches would be a valuable addition to our mowing land ; they are distinguished, I believe, by having a long foot stalk to the blossom, whilst the annuals blossom close to the stem, the seeds of such plants should be carefully gathered, cultivated, and increased, to be ready for sowing in laying land to permanent grass : to these may be added, the *lathyrus pratensis*, and the hare's foot trefoil for the most barren sands ; the bird's foot trefoil for any soils ; most of these are natives of this county : the weeds and injurious plants should be pointed out for their destruction, and a more general knowledge of, and attention to, the science of botany, could scarcely fail being productive of improvements in agriculture.

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AGRICULTURAL SURVEY
OF
WORCESTERSHIRE.

CHAP I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. I.—SITUATION AND EXTENT.

WORCESTERSHIRE is an inland county, bounded on the north by Staffordshire, on the east by Warwickshire, on the south by Gloucestershire, south-west by Herefordshire, and north-west by Shropshire, and lies between $52^{\circ} 0'$ and $52^{\circ} 30'$ north latitude, and between $1^{\circ} 30'$ and $2^{\circ} 30'$ west longitude from London: its extent has been variously estimated. Dr. Nash, in his General History of the County, states the greatest length at 43 miles from south-west to north-east; length along the Severn 30 miles, mean length 36, breadth 26, content 936 square miles, or 599,040 acres, to which he adds for detached parts 19,200 acres, making in the whole 618,240 acres; he further observes that the county is rich in grain, fruit, and pasture, and that the air is soft, warm, and healthy.

On the contrary, from an account published in the **WORCESTERSHIRE.**] B Monthly

Monthly Magazine, November, 1805, and there stated to have been published by the House of Lords, this county is said to contain only 674 square miles, or 431,360 acres. I know not from what documents, or authority, this account is derived, but am of opinion that both this and the former account are erroneous, the one being too much and the other too little. By comparing the county with Carey's Map, I estimate the mean length, from north to south down the Severn, at 30 miles; and the mean breadth, from east to west, at 25 miles; content 750 square miles, or 480,000 acres; of this two-thirds are to the east, and one-third is to the west of the river Severn. To this may be added, for detached parts, 20,000 acres, making in the whole 500,000 acres.

SECT. II.—DIVISIONS.

Historical and Political. This county was part of the ancient Cornavii, or Dobunii; during the Saxon Heptarchy it belonged to the kingdom of Mercia; it is divided into five hundreds, and two limits, containing one hundred and fifty-two parishes, one city, Worcester, and eleven other market towns. The names of the hundreds are as follow:

Blackenhurst, to the south-east of the county.

Dodintree, on the west side.

Halfshire, on the north-east.

Oswaldstowe, dispersed in different parts.

Pershore, in the south on both sides the Severn.

It is in the Oxford circuit.

Nine members are sent to parliament, viz. by the county,

county, two ; by the city of Worcester, two ; by Droitwich, two ; by Evesham, two ; and by Bewdley, one.

The Vale of Evesham is an indefinite tract of country in the south-east part of the county : it includes the whole valley of the Avon, the contiguous upland to the north of that river, the whole of the vale land to the south extremity of the county, and the adjoining vale land of Gloucestershire ; it has always been famous for its fertility, particularly in corn, consisting generally of a deep rich loam, not easily exhausted of its productive qualities, if kept tolerably clean from weeds.

Worcester is a city and bishop's see ; the county is in the diocese of Worcester, and province of Canterbury ; the bishop's seat is at Hartlebury, in a fine pleasant, healthy, and fertile country, particularly famous for elm-timber, the finest in the kingdom.

SECT. III.—CLIMATE.

The climate of Worcestershire, but particularly of the middle, south, and west of the county, is remarkably mild, soft, healthy, and salubrious ; the Vale of Severn, but little elevated above the level of the sea, and the vallies of the Avon and the Teme, upon nearly the same level, with the contiguous uplands rising to 50, 100, or 150 feet above their level, have at this low elevation a warmth and softness which ripens the grain, and brings to perfection the fruits of the earth from a fortnight to a month earlier than in more elevated countries, even though the soil and surface were similar.

It

It has been estimated that sixty yards of elevation or rise in the land, are equal to a degree of latitude; or that land sixty yards perpendicularly higher is, in respect to climate, a degree more north; agreeable to this idea, the north-east of the county between Bromsgrove and Birmingham, which is considerably more elevated, is also considerab'ly later. In an excursion over the county the first week in September, 1805, I found the harvest finished in the early districts; but, in the latter, all kinds of grain, part cut, part growing, and many farmers had carried no wheat, and in some places the grain not ripe.

To the north-east of Bromsgrove arises a ridge of hills, termed the Lickey, which continues in a chain to Hagley, and diverges easterly in various directions, rising in some of its peaks to 800 or 900 feet elevation; this district from its height, exposure, and inclement atmosphere, may be considered, in point of climate, as three or four degrees more north than the fertile parts of the county; the other elevated grounds are Malvern Hills, a mountain or group of mountains, extending nearly from north to south, upon a base of about six miles in length, and from one to two in breadth, a line along the ridge of whose summits divides this county from Herefordshire: the highest of these summits, according to Dr. Nash, rises to 1313 feet perpendicularly above the Severn.

Abberley Hills, in the north-west, are of considerable magnitude, and seen to a great distance; they extend over a parish of the same name, and probably rise to 800 or 900 feet perpendicularly above the Severn, and consist, according to Dr. Nash, of a cold wet clay on limestone. Witley Hill, south of the latter and near it, is also a strong soil on limestone.

Bredon

Bredon Hills, south of Pershore, and south-east of the Avon, is also of considerable height and magnitude, and seen to a great distance; these are the bleak and inclement parts of the county; the remaining lowlands and fertile vales have an atmosphere warm, salubrious, and healthy, as any in the kingdom. Bredon Hill is probably of 8 or 900 feet elevation above the Avon, and stands upon a base of very considerable extent, the surrounding cultivated lands being generally of great fertility.

As the time of harvest is considerably indicative of the climate, I shall here observe that in 1807, wheat reaping commenced on light land near Kidderminster July 23d, and a few days after, in different parts of the county; rye reaping the same; a field of barley was finished carrying August 3d; the same at Fladbury the first week in August; at which time the reaping of both lammas and cone wheat, and the mowing of barley and oats was becoming general in the Vale of Evesham, and most parts of the county.

I could gain intelligence of no meteorological registers; the largest proportion of rain comes from the south-west. I suspect a much less quantity falls here, than in the counties more inland and more elevated; in Staffordshire the annual rains generally exceed thirty-six inches; in this county I suppose them to fall short of thirty, the clouds flying over the low lands, and, as they pass on, becoming attracted by that more elevated.

SECT. IV.—SOIL AND SURFACE.

Beginning with the lowest grounds, the Vale of Severn extends through the county from north to south about thirty miles in length, and from a quarter of a mile to a mile in breadth, containing probably ten thousand acres of a deep and rich sediment, deposited from time immemorial, by the waters of this river, and by the streams it receives from the contiguous country, in what was probably originally an unformed ravine ; this sediment consists in some places of a pure water clay adapted for brick-making, but generally of a rich mud fertile and favourable to vegetation ; it consists of rich meadow and pasture, on which are fattened great numbers of sheep and cattle. The channel of the Severn is generally about eighty or one hundred yards wide, sometimes more considerably ; and five or six yards in depth, its fall about one foot in a mile, being about thirty feet in the extent of the county ; in the lower part of the county it becomes a deep still water, uniting with the tide ; in floods, the channel is not sufficient to contain the water, though in the summer season it sometimes sinks to less than a yard in depth in the middle and upper parts of the county, so as to be scarcely navigable.

The Warwickshire Avon enters the county above Evesham, and running through it including its various windings above twenty miles, falls into the Severn, near Tewkesbury, and is navigable for barges all through the county ; its banks, like those of the Severn, consist of rich meadow and pasture.

The Teme from Wales and Shropshire, enters the county

county at Tenbury, and winds through it for about thirty miles to the Severn at Powick ; it is somewhat more rapid than the Avon, but navigable for barges as far as Powick-bridge and a little higher : in its accompanying vale are a great number of hop-yards and orchards, and its banks abound with fertile meadows, and rich feeding pastures.

The Stour from Stourbridge, after passing through the Staffordshire parish of Kinver, re-enters Worcestershire at Wolverley, and runs through it in all ten miles to the Severn at Stourport ; its banks contain some good meadow and pasture land, and some bog ; this river is said to arise in the famous Leasowes of the poet Shenstone.

The Salwarpe, a smaller river from Droitwich, falls into the Severn above Worcester ; besides which, the whole county is intersected, in various directions, with brooks and small perennial streams, which empty themselves into the different rivers, and whose banks consist of rich pasture and fertile meadow land, producing an abundant supply of hay; not only for the consumption of the county, but large quantities are sent by the Severn, and the *Trent and Severn canal*, into Staffordshire.

From these rivers and rivulets, the upland gradually arises in gentle slopes and swells, to the height of 50, 100, 150, and 200 feet above the level of the tide ; few instances of any extended plain of flat upland, but the country varying and waving in all directions ; and as you approach the hills, and towards the north and north-east, rising to a greater elevation, the soil and surface may, I think, be properly divided as follow :

1. The natural meadows and pastures on the rivers and rivulets as above named.

2. The

2. The rich clay and loamy soils, in the middle south and west of the county, and which may, I suppose, include half the county, and where the peculiarities of Worcestershire chiefly rest ; here hop-yards and orchards, with the various kinds of fruit, are cultivated, in addition to the usual culture of other countries.

3. The light sandy soils, or sandy gravel, about Kidderminster and Stourbridge, and their vicinity ; of these, some are sterile and barren, as those of Mitten and part of Wolverley ; others, rich and fertile ; the crops here are generally equally early with those in the fertile part of the county ; the elevation of ground too, is here less than in the succeeding districts.

4. The mixed springy gravel and gravelly loam to the north-east of Bromsgrove, including the hilly cultivated districts ; here the crops are much later than in the other parts of the county ; and little attention is paid to fruit as not succeeding spontaneously, or without walls and shelter.

5. The waste lands, mountainous districts, and wood lands, but which bear a small proportion to the extent of the county at large.—See WASTE LANDS.

Mr. Pomeroy says, “ the face of this county, when viewed from any of the surrounding eminences, approaches rather that of a plain ; the gentle slopes and risings to the east and west of Worcester, remaining scarcely any longer discernible. The state of its cultivation appears to very great advantage, as there are no tracts of any considerable extent, so barren, or so totally neglected, as to be without an agreeable, and profitable verdure. On a nearer view, from the central hill, which rises more particularly to the east of that

that city, a most beautiful landscape presents itself: the whole of the back ground, which, at its greatest distance, does not exceed twelve, and no where approaches nearer than eight miles (allowing something for the openings to the south-west and north), appears to be one continuation of noble hills; forming, as it were, the frame of the delightful picture that presents itself in the centre, diversified with all the beauties of hill and dale, wood and water. If the Aberley and Whitley hills occasion some irregularity in the frame, they will scarcely be thought to take off from the beauty of the piece; these, and the adjoining hills, rising with a bold front, and most of them cultivated to their summits, recalls to the mind the enthusiastic description of Italy; and the sheep, hanging as it were, from the brows of others, illustrate the much-admired idea of the Roman bard.

" The soil is various: to the north of Worcester, which is situated nearly in the centre of the county, it chiefly consists of rich loamy sand, with a small proportion of gravel; there is some very light sand; a few spots of clay; of black peat earth the same; but chiefly inclining towards the east. In this quarter (the east) the prevailing soil is, for the most part, a strong clay. The waste land, which is not very considerable, in general a deep black peat earth. To the south, between Worcester and the Vale of Evesham, the soil is partly of red marl, and part strong loamy clay; other parts sandy loam; and there is a small vein of land which partakes of each of these qualities; the sub-soil, more especially under the second division, limestone. In the vale, the soil is particularly deep, of a darkish colour earth, with a sub-stratum of strong clay and some

some gravel. Beyond this, on the confines of the county, and in the small detached parts, including the Cotswold Hills, a limestone prevails on the upper land, and a rich loam on the lower. To the south, between Worcester and Malvern, the general character of the soil, is a clay, mixed with gravel in different proportions; the former prevailing in the lower, and the latter in the higher situations. To the left of this line, including Malvern Chase, a deep surface of clay is found in some places; in others, a rich loam, inclining to sand; sub-stratum supposed to be marl. To the right, till we approach a central point between the west and north, the proportion of clay increases gradually, till at last, a strong clay occurs; this again becomes gradually more gravelly, till it joins the light sands in the north, below partly marl, partly soft sandy stone, and some limestone is found; in each of these districts is some very rocky land, and in most, some loose stony soil, or stone brash, is met with, but nowhere are there any traces of chalk or flint."

Mr. Oldacre observes, "that the meadow soil, by the sides of the Avon, and the other rivers and brooks, is most generally a loamy clay."

In several excursions into different parts of the county in 1807, I made some further observations on the soil, as follow:

The late inclosed land of Bromsgrove Lickey, which is a gravel or gravelly loam surface, is often a sandy under-stratum to a considerable depth; but sometimes on the higher grounds, the under-stratum is an irregular granite rock, or an hard congelation of gravel.

On some of the hilly ground in the north-east of the county, the soil is a moist clay loam, on a brashy rock bottom,

bottom, or a lighter loam on clay, or on the same loose brashy rock ; being of the nature of the plum-pudding stone, or Breccia.

The sandy lands of Wolverley often continue sand to a considerable depth, or terminate in a sandy rock bottom, sometimes near the surface or at different depths.

The Vale of Evesham, whose arable surface is generally a strong clay loam, has various under-stratum, sometimes an ochery coloured gravel, sometimes clay ; this clay is generally unfit to make brick, on account of containing a calcareous mixture called Lime-wash, which burning into lime, would, on exposure to wet, burst the brick in all directions ; but large tracts have a loose limestone bottom, and some a solid calcareous flag stone.—See MINERALS.

The soil and surface of Worcestshire may be thus arranged, but perfect accuracy must not be expected.

	Acres.
Light land, sand, sandy loam, gravelly, and gravelly loam -- --	120,000
Mixt friable loam adapted to general culture, part fit for turnips, hops, fruit, and most other produce --	120,000
Strong clay loam of various depths, where not too wet, often adapted to fruit, and hops, also to wheat and beans, but too strong for turnips to advantage -- --	120,000
 <hr/>	
Carry over Arable land	<hr/> 360,000
 <hr/>	
	Brought

		Acres.
Brought over	Arable land	360,000
Natural meadows on the Severn, Avon, Teme, Stour, Salwarp, and other rivers, brooks, and rivulets, part of this peat, part sediment from the streams	-- -- --	50,000
Grass land in permanent pasture, in- cluding parks, plantations, and plea- sure grounds	-- -- --	50,000
Woodlands, roads, rivers, waters, towns, villages, buildings, yards, and gar- dens	-- -- --	20,000
Wastes and commons	-- --	20,000
		<hr/>
	Total	360,000
		<hr/>

Of the arable land, the common fields may be	-- -- --	20,000
Inclosed ditto	-- -- --	340,000
Permanent grass land as above	--	100,000
Kitchen gardens, suppose	--	5,000
Wood, wastes, roads, rivers, &c.	--	35,000
		<hr/>
	Total	500,000
		<hr/>

The orchards and hop grounds must be included in the arable and grass land, the former are often cultivated for grain, and sometimes at grass, the vacant spaces between the hop plants are also sometimes cultivated for potatoes, cabbages, turnips, and pulse, particularly in new-planted hop grounds.

SECT. V.—MINERALS.

This county is not particularly famous for mines and minerals, and indeed Nature has been so propitious to its surface, that it is rich enough without searching beneath; and it is generally in more mountainous countries that valuable mines and minerals abound; it is not, however, wholly destitute of mines.

Brick clay, gravel, sand, and marl, are common, and limestone in the hills, and various other parts of the county, and in some places burnt for use, particularly at Whitley, and again at Haddington; but the distance and dearness of coal prevent its being burnt in such quantity as to be generally used for manure; it is, however, used occasionally.

Freestone for building is found in various places.

Coal is raised in the north-west of the county, particularly at Mamble, which has a communication by a railway with the Leominster canal; and again at Pensax, where coaks are made of it, highly esteemed for drying hops; they are also used for burning the limestone of Witley Hill; but the vein of coal is but about two feet, or two feet six inches thick, and lays at about twenty yards deep; the water is raised in buckets, the mines not being rich enough to support a steam engine. The rich coal mines near Stourbridge, as well as the glass-house pot clay which lays beneath are in Staffordshire.

Quartzum, a silicious primeval stone, forms the basis of the Malvern Chain; a similar substance also constitutes the staple of the most precipitous swells of the Lickey, north-east of Bromsgrove.

Sal commune, common salt; one of the richest sources

sources in the whole world, of this domestic article, is at Droitwich, in this county.—See Chap. XV. POLITICAL ECONOMY.

Limestone is found in plenty in various parts of the county ; it forms the under-stratum of a considerable part of the Vale of Evesham ; at South Littleton I observed a lime-kiln where lime is burnt for manure.

In the Vale of Evesham, in the parishes of Badsey, and of North, Middle, and South Littleton, are quarries of calcareous flagstone, which are regularly worked, and where considerable quantities are raised for grave-stones, barn floors, and floors for halls or kitchens ; the thickness is about three inches, and they are extremely hard and durable, and can be got of any reasonable length or breadth, I saw some of four or five yards in length ; the price at the quarries is five pence per foot superficial ; the refuse, or broken stone, is used for mending roads, or will burn into good lime.

SECT. VI.—WATER.

The rivers and rivulets have been mentioned before, under the article Soil and Surface ; the principal rivers arise in other counties, but have tended greatly to the improvement of this, both by the commercial advantages they afford from their navigation, and by the fertility of soil on their banks, from the sediment brought down by their floods during a course of countless ages.

There is no lake in this county, nor any pool or pond of very remarkable size, a few of moderate dimensions are attached to gentlemens' seats and mills. The largest artificial piece of water I saw in the coun-
ty,

ty, is upon the Packington estate of Westwood, near Droitwich: within a walled park well stored with timber and plantation.

The artificial canal navigations, will be noticed further, under the article Political Economy.

Malvern Well, situate on the west side of the mountain, about one-third up its slope, is now of considerable resort, both for bathing and drinking the water; it is perfectly limpid, without smell or taste, but said to be slightly chalybeate: some good lodging houses are within a convenient distance. The air of this mountain is extremely pure, clear, and healthy, and the perspective from it, extensive, delightful, various, and picturesque.

FISH.

Salmon, Shad, Lamprey, and Lampern, abound in plenty in the Severn; and these fish, from this river, are highly esteemed, all over England and abroad.

"Although the river Avon, at its mouth near Tewksbury, exactly resembles the Severn, and there joins it, yet no Salmon, Shad, Lamprey, or Lampern, ever mistake their course, or go up the Avon." *Nash.*

"The Lamprey of the Severn (*petromyzon marinus*) grows to twenty-six inches long, and is often three or four pounds weight; it leaves the sea in the spring, and is esteemed a great delicacy, but unwholesome when eaten too freely or in quantity, witness the death of Henry I." *Nash.*

"The

"The Lampern (*petromyzon fluviatilis*) goes to the sea at certain seasons; more common than the last, and less esteemed; about ten or twelve inches long, and little more than the size of a man's finger; common in Worcester market, and in the shops there potted and preserved; vast quantities are taken at Mortlake, and sold for baits to the Cod fishery."

Nash.

CHAP. II.

STATE OF PROPERTY.

SECT. I.—ESTATES.

THE landed property of this county, like that of all other commercial parts of the empire, is diffused into the hands of the various classes of mankind, from the privileged peer, the titled commoner, the opulent esquire, the merchant, thriving manufacturer or tradesman, to the independent, but less opulent, freeholder and yeoman; land being often upon sale, becomes the property of those who have saved money to purchase it, either by hereditary property, by trade, or agriculture. The county has a good many resident families of considerable opulence and fortune.

2. TENURES.

The tenures here, as in other parts of the kingdom, are either freehold, held by a prescriptive right; copyhold, held under a superior lord, by a copy roll in perpetuity, but subject to payment of fines upon death of the owner, by his successor; or upon transfer or alienation; or thirdly, leasehold under the church, or public bodies, for three lives; when a life drops, the lessor may, or not, at his pleasure, put in another; but, having only a life interest, he generally does so, upon payment of a suitable fine by the lessee; the reserved rents in these cases being generally very small in proportion to the present value.

CHAPTER III.

BUILDINGS.

SECT. I.—HOUSES OF PROPRIETORS.

THIS county contains a considerable number of magnificent residences of nobility and gentry; but, which, not being exactly agricultural objects, were not many of them particularly noticed by the writer hereof; the following are some of the most prominent:—

Croome Park,	seat of the Rt. Hon. the Earl of Coventry.
Hewell Park,	— The Earl of Plymouth.
Whitley Court,	— Lord Foley.
Hagley Park,	— Lord Littleton.
Madersfield Court,	— Lord Beauchamp.
Ombersley Court,	— Marchioness of Downshire.
Hanbury Hall,	— — — Phillips, Esq.
Westwood Park,	— Sir Herbert Packington.
Stanford Court and Winterdine,	— Sir Thomas Wimington.
Overbury.	— Mr. Martin.
Lea Castle, Wolverley,	— Mr. Knight.
Hartlebury Castle,	— The Bishop of Worcester.
The Ryd, on the west bank of the Severn,	— Mr. Lechmere.

2. FARM HOUSES AND OFFICES, AND REPAIRS.

This county being principally ancient enclosures, the farm houses have consequently been erected at different, and many of them in remote times, and before the general arrangements of design for elegance, or even comfort and convenience were much thought of; they therefore contain nothing singular or striking; some of them have been renewed, but by degrees and at different times, others retain their original design having occasional repairs, and upon the whole there is nothing singular or remarkable in the farm edifices of this county.

Mr. Darke says, respecting Bredon, " we rather excel in our farm houses, which are chiefly situated in villages near the common fields."

Mr. Oldacre observes; " the farm houses and offices are not on a good construction; and the situation almost generally ill chosen, which is often attended with great loss to the occupier. Sheds for feeding cattle in winter should be encouraged, as such feeding adds greatly to the dunghill both in quantity and quality."

I observed in my tour through the county some few handsome new erected farm houses, slightly scattered, but the general part are of ancient construction, badly designed, and placed off the farm in villages, and often with walls of timber and mortar or plaster; when these shall be decayed, more attention will probably be paid to their future construction.

Respecting out offices, very few instances are to be found of any particular convenience in their construction, and the farmer is obliged to make shift as well as he can.

Mr.

Mr. Pomeroy says, " It appears to have been formerly a very general custom, to build farm houses in low situations; undoubtedly for the convenience of water. Most of the old buildings continue in such places; and as it is but seldom that the whole require to be rebuilt at once, it will probably be some time before they are in general extricated. The inconveniences, and even losses, are however so great, that no small saving can counterbalance them. It cannot be necessary to point out to those who are interested in this subject, what they are, nor the advantages of removing their buildings to more elevated spots, and where the land will of course be sounder. One circumstance, however, as not being so immediately connected with the general system of this district, it may be right to mention, and that is, the opportunity obtained, of conveying by rain, melted snow, or streams, naturally descending from the still higher grounds, in winter, the most valuable parts of the manure produced in the farm yard, over the adjoining lands; an acquisition, the importance of which is not easily conceived by those who have not seen it practised. Some of the old farm houses are well built, and convenient; most of the newly erected ones have the same advantages, and are in general well situated; some of which may be said even to grace the county, and as such, may be classed with its greatest modern improvements.

" A great deficiency in the offices of the middling and lower sized farms, is the want of sheds for cattle in winter; besides the quantity of fodder they destroy, and the mischief they receive, from being exposed to the inclemency of the weather, it is not unusual to observe many acres round the yard, very materially injured by their constant treading. This grievance, particularly

particularly in the low situations so frequent in this, and many other counties, is certainly of such consequence, as to deserve the most serious attention."

Respecting the local out buildings, necessary for the manufacture of fruit into liquor; particulars are detailed under the article ORCHARDS.

In the west and south of the county stall feeding is sometimes resorted to, and feeding sheds are of course attached to the principal occupation. Plate I. is a sketch of a feeding shed belonging to — Smith, esq. of Erdiston, in the west of the county, upon a scale of an inch to ten feet, it contains room for fourteen head of cattle four feet asunder, being fifty-six feet in length and twenty-four in breadth; the front is faced with paled gates to keep it airy; the beast are each tied by means of an iron ring and chain, to an upright pole fixed in a sill; before them are a range of stone troughs built solid, two to each beast, the one for food the other for water, with a roomy gangway before them, to contain and deal out their food from; if the whole were divided into stalls it would doubtless be an improvement.

S. COTTAGES.

The cottages, analogous to the farm buildings, are of different ages of construction, and those in different parts of the county occupied by farming labourers, have, in general, nothing particular to recommend them; in the ancient villages and common field parishes, they often consist of timber and plaster walls covered with thatch, and are merely a shelter from the

weather, without any particular attention having been paid to comfort and convenience, but with the addition of a garden for potatoes and other vegetables.

The most comfortable cottages I had an opportunity of observing in the county, are in the parish of Bromsgrove, and particularly in the neighbourhood of the Lickey; this having been a considerable waste of two or three thousand acres, a good many cottages had been long erected, and upon enclosure due attention has been paid to their rights by giving them an allotment of land. The same circumstance has also occurred at Bourn Heath, in the same parish, where about twenty cottagers existing thereon, had, upon enclosure, their land enfranchised, and they, as well as the before-mentioned, now live comfortably on their own premises, with well cultivated gardens, potatoe grounds, and pigs, but no cows; the cottages are generally neat and comfortable, many of them new built with brick and tile: they are, in part, inhabited by farm labourers.

In some of the older cottages, in the same parish, the occupiers are the owners, and besides potatoe grounds and gardens they have the addition of fruit trees, which adds considerably to their comforts. Mr. C. who lives in this neighbourhood, by my desire, attended me to many of these cottages; several of them, are very properly built near a perennial stream of clear water, an object of considerable consequence, and which should be always had in view in the erection of cottages, where there is the command of such convenience.

Plate II. is a sketch of three cottages erected on the new inclosure of the Lickey, but built by a person to let; they are supplied by the same pump, and one

one small room serves them all for washing and baking ; they are occupied by two labourers, and one nailor who requires a workshop ; the tenements have each two private lodging rooms over each kitchen and pantry respectively.

Estimate of the cottages in Plate II. according to the common prices of building in Worcestershire.

£ s. d.

400 yards of brick work, one brick

length, at 4s. 6d. 70 0 0

120 yards of brick flooring, at 1s. 6d. 9 0 0

2000 feet of tiling and lath nails,

at 20s. per 100 20 0 0

450 yards of wall plastering, at 8d. 15 0 0

120 yards of ditto, on lath, at 1s. 6 0 0

Total Bricklayer —————— 100 0 0

The inside cross walls are only half

brick thick, two being reckoned
for one in this estimate.

Carpenter.

900 feet of chamber flooring, oak
timber and elm boards, at 3l. per

100 feet, materials and labour 27 0 0

1800 feet of roofing and laths, at

2l. per 100 feet 36 0 0

Five outside doors and frames, at

15s. six inside ditto, at 12s. 6d. 7 10 0

Fourteen window frames, three

flights of stair steps and sundries 9 10 0

Total Carpenter —————— 80 0 0

Window glass, casements, and paint 10 0 0

Total —————— 210 0 0

BRIDGES.

BRIDGES.

The principal bridges in the county are those over the Severn, of which Worcester has a very handsome modern built stone bridge ; there is also another at Upton, and a third at Bewdley modern built ; but the most extraordinary and remarkable is that at Stourport, consisting of a single iron arch over the main channel of the river, of 150 feet span, and about 50 feet perpendicular rise above low water. The avenues to this main arch consist of a number of brick arches, covering the flood water way ; the former bridge was of stone, and after standing only a few years from its erection, was swept away by a great flood, and immense shoals of ice brought down in consequence of a sudden thaw, after a great snow and severe frost ; it was therefore, with great public spirit, determined to erect the present iron arch, which is so roomy that no obstruction is given to the course of the river under any circumstances. The thoroughfare over this bridge is so considerable, that I understand the tolls upon it are farmed at about 500l. per annum.

CHAPTER IV.

OCCUPATION,

SECT. I.—SIZE OF FARMS.

MR. POMEROY says, and it agrees with my observations, "the farms are small, from 40l. or 50l. to 300l. or 400l. a year, but some larger; there are certainly more small than large farms; the number of gentlemen who occupy land has increased considerably of late years, and some there are who hold forth very laudable examples of improvement."

The estates are, in general, tenanted by tenants at will, with no other restrictions than those customs has introduced; but there are some instances of old leases for long terms, and these farms being low rented, has set landlords generally against granting leases; when granted lately they have been chiefly running leases for twenty-one years conditionally, but determinable every seven years. The land is divided between pasture and cultivation, but in what proportion will be hereafter seen by inferences to be drawn from the commonly practised courses of crops.

Mr. Oldacre, of Fladbury, observes, "the land, in his neighbourhood, is principally occupied by tenants,
the

the unenclosed farms are small in general ; the enclosed ones most commonly from 60 to 150 acres, but there are some from 2 to 5 and 600 acres each."

Mr. Darke says, " the farms in Bredon are from 10l. annual rent to 500l."

The fields of the unenclosed parishes have a certain proportion always in tillage ; but the enclosed farms are employed, sometimes in tillage and sometimes in pasture, according to the judgment of the farmer or nature of the soil. I have seen two farmers, upon the same kind of soil, manage their land very differently, and yet both live well and get money.

The large farmers have certainly a turn to improvement, the small ones have not an opportunity, or seldom have it in their power ; but there are many inventions proposed and introduced, and the sensible farmer unfortunately finds few of them that will answer.—

Mr. Oldacre.

Mr. C. says, " large farms and opulent farmers are of great consequence in times of plenty, by keeping grain till it is scarce or wanted ; small farms are most useful in supplying the public with many articles which large farmers do not think worth their notice : it is therefore proper, on these and other accounts, that there should be farms of various sizes."

Under the article Occupations, I think I may venture to detail some particulars of two farms in this county ; the one, a light sandy warm soil, in the hands of the owner, T. Knight, esq. Lea Castle, Wolverley ; the other, a strong and rather cool soil, in the occupation of Mr. Richard Miller, at Worley Wiggorn, an hamlet of Hales Owen, but in the county of Worcester. They are both managed in a capital and spirited style.

Mr. Knight's occupation consists of about 330 acres,

it

it is not yet brought into the system intended; in July, 1807, it was thus occupied:

Turnips	--	--	70
Swedish ditto	--	--	5
Barley	--	--	50
Wheat	--	--	14
Carrots	--	--	10
Vetches	--	--	10

159 acres, the rest

homeage, pasture, meadow, woods, and plantations.

Turnips are mostly drilled, but some sown broadcast. For the particulars of their cultivation here, see TURNIPS, in Chap. VII.

Barley succeeds turnips, and is laid in by a similar drill.—See BARLEY, in Chap. VII. Mr. Knight has made experiments on folding sheep for both wheat and barley which will be there detailed; he uses lime and soot plentifully, and means to bring his farm nearly into the Norfolk system but with some variations.—See COURSES OF CROPS, &c.

PICTURESQUE FARMING.

About 200 acres around the mansion, formerly in irregular uncouth divisions, with wide slovenly hedges, are now laid, or laying together, the roads better disposed both for convenience and appearance, and the hedges stocked up, but the trees, which are in abundance carefully preserved, to give a park like appearance; this is, at present, divided into lots by temporary hurdles, and may hereafter be more permanently divided

vided by quickset fences, planted and disposed so as to have the best landscape effect.

Mr. Knight grows carrots with great spirit, to the extent of 10 acres annually, and means to persevere in their growth. Wolverley has long been famous for growing carrots, and for saving carrot seed, but the growth was declining till he took it up and roused the attention of the farmers around him, who now, many of them, grow a few acres each. He generally buys carrot seed in London, though some of his neighbours grow it, one of them refused him carrot seed from jealousy; he thinks the London seed equally good.

The occupation 330 acres when brought regular, is intended to be 240 acres arable in the Norfolk system, or near it, and 90 acres meadow, pasture, and plantation; the variations from 60 acres each, turnips, barley, clover, wheat; will be 10 acres of carrots, and about the same breadth of vetches constantly, and sometimes a piece of oats, which may be grown either in the second or fourth year of the course, and vetches in the third year instead of clover, also carrots either after clover or turnips.—See COURSES OF CROPS.

Mr. Knight has, at present, two sorts of sheep, Leicester and South Down; but proposes to fix in the fine woolled sheep. His steward was gone, the last time of my being there, September 29. 1807, to endeavour to procure a lot of the true Ross breed (this breed is supposed to be nearly extinct); he means to keep South Down, Ryeland, Merino, and Crosses, and has now a Merino ram bought from Lord Somerville, of very fine wool, but uncouth in the head and neck; but this ram has, nevertheless, got some good looking stock from South Down ewes. He has a South Down ram bought from the Duke of Bedford, at 40 guineas, and another

South

South Down ram which cost 30 guineas, and has some thoughts of procuring a Spanish ram from Mr. Tollet. He believes he shall be able to keep 400 ewes, and 100 theaves, but intends to sell his other lambs fat, except some ram lambs for stock, or any that should not be fit for the butcher are meant to be sold as stores in autumn; his sheep stock is proposed to be 400 ewes, 100 theaves, 50 rams and wethers, and he supposes 500 lambs may be produced.—See the article SHEEP. Mr. Knight also proposes to winter feed a good many cattle with turnips, to make the best of his straw. Such cattle to be bought in fresh and in good condition, as few cattle will be bred on the premises, a dairy being only kept for the family supply, and not as an object of profit.

HORSES.

Respecting horses Mr. Knight is rather singularly circumstanced, when the situation of public affairs rendered it adviseable for the volunteer cavalry to be raised, he resolved to come forward with a troop raised in his own neighbourhood, and principally at his own expense; to forward which plan his own heavy cart horses were sold off, and cavalry horses purchased in their stead; he now mounts ten of his own servants or dependants, upon as many of his own horses for military service; these horses do all his extensive farming business, and occasionally serve for saddle horses, or to draw his carriage; they, in part, appear to me of the Yorkshire breed, are of quick step in different paces, either for farming purposes, the road, or the army;

army. They were, in part, purchased from army contractors, and the rest picked up promiscuously as the purpose could be suited; they are all constantly kept in the stable the year round, and fed with vetches, carrots, cut hay, &c. with the additional allowance of a bushel per head per week of oats, and a peck of beans, and are constantly in exercise, and active working condition: more particulars of Mr. Knight's farm will be given under the different heads.

2. Brant Hall, in the hamlet of Worley Wiggorn, in the parish of Hale's Owen, Richard Miller, tenant on lease, the soil part moist clay loam on brashy rock bottom, part lighter loam on clay, part lightish loam on a loose brashy rock, some peat bog, but now drained, the whole elevated and inclining to cold, harvest later by a month than the fertile or early parts of the county, some of the hills or swells from 7 to 800 feet elevated, above the sea level.

	Acres.
Extent of the farm --	218
Wheat, barley, oats, about 14 acres each	-- 42
Turnips 4 acres, Swedish ditto 4 acres, pota-	
toes 4 acres, cabbages 2 acres	-- 14
Vetch fallow 6 acres, wheat fallow 8 acres	-- 14
Water meadow 30 acres, pasture 118 acres	-- 148
Total --	218

This occupation, as will be seen by the distribution above stated, has been generally and very properly thrown to grass, and well stocked with sheep and cattle; the former, of the Leicester; the latter, of the long horn breed. The cows are long horn, and 20 or
more

more kept in the dairy, and of a sort highly improved.

—See CATTLE.

Sheep, Leicester, and very respectable, 80 breeding ewes kept, and crossed with highly improved rams.—
See SHEEP.

Seven horses do the business of the farm, including a hackney and breeding mare, who had foaled, before March 30, 1807, when I was on the premises: the horses black and brown but not heavy, about fifteen hands and a half high, they are employed at all leisure times in drawing muck from Birmingham in a 6-inch wheel waggon and six horses, the distance six miles, the price 7s. per ton, and several hundred tons drawn in a year. This farm, by dint of industry and perseverance, has been greatly improved, and is in a state for producing good crops, and well supporting a large stock. Further particulars will be given under the different heads of this survey.

3. To these, I may just add a sketch of the occupation of —— Smith, esq. of Erdiston, (pronounced here Yerston) in the parish of Lyndridge, and on the Teme. He has formerly occupied 1000 acres, or more of his own land, including from 1. to 200 acres of orcharding, and 50 acres of hop ground; but has lately let off about 500L per annum, retaining still several hundred acres, with hop ground and extensive orcharding; has grown fruit enough in one season to make 5 or 600 hogsheads of fruit liquor, and can this season, 1807, make 2 or 300 hogsheads; his orchards in great perfection, and new ones constantly planting in succession. Many of his orchards are fallowing for wheat this season, and in others beans have been grown, both set and broadcast; set beans are not always planted in rows in this part of the county.

Mr. Smith's 12 dairy cows and bull are Herefords, but he has Shropshire long horns as well as Herefords for fatting : he grazes and sometimes stall feeds oxen of both these breeds. Further particulars of this occupation will be found under the different heads of this survey.

2. RENTS.

Rents are universally paid in money, though slight personal services are sometimes required, as team work, keeping a game dog for the landlord, &c. The rent of farms is generally as follows :—Common field farms with enclosures near the homestead, 20s. per acre ; enclosed farms of inferior land about the same, but those of better land rise to 30s. per acre ; and some few instances of whole farms let to 40s. and even 50s. per acre all round, but these are of superior staple, and contain a good proportion of pasture or meadow land ; and near commercial places or populous towns rents are still much higher, the meadows on Severn, near Stourport, are sometimes let from 4l. to 5l. per acre, and water meadows in the neighbourhood of Bromsgrove, and in other parts of the county at the same rate.

In 1776, Dr. Nash estimated the rental of common field and arable land at from 10s. to 20s. per acre, of pasture land at 20s. per acre, and of water meadow at 30s. per acre, and the rental of the whole county at about 300,000l. per annum. I suspect that in this estimate the annual value of parks, pleasure grounds, plantations, woodlands, and similar premises occupied by the owner is not included, and suppose the rental of

of the county from that time to the present, 1807, being 31 years, has nearly doubled; and that the present value of the county in annual rent, including the occupations of gentlemen, is not less than 600,000l. per annum.

As a proof of the great alteration that has taken place in the value of land by improvement, or by alteration in the value of money, or by a combination of both, I was informed of an estate in the Vale of Evesham, now worth full 500l. per annum, that was purchased by the ancestors of the present possessor in the reign of King Henry VIII. for thirty-five guineas; I was not informed whether this estate was freehold, or of an inferior tenure.

I had good information that 10l. per acre are sometimes given for turf land for one year to set with potatoes.

I was also informed of the following bargain for land for two years.—The tenant undertook to muck it at the rate of 10 tons per acre, and lime at 5 tons per acre for turnips, then to take barley, and then to turn up the land to the landlord paying no rent, but having the two crops for his manure and labour, and the landlord receiving back the land thus improved without any rent; this bargain being out of the common way has been a subject of some conversation. I make the following estimate of this bargain:—

The Tenant	Dr.	Contra	Cr.
	£ s. d.		£ s. d.
To turnips, per acre .	5 0 0	By 4 ploughings for tur-	
		nips, at 10s. 6d. per	
To barley ditto, 30 bu-		acre	2 2 0
shel, at 6s. 8d. . . .	10 0 0	Harrowings and sow-	
	—	ing ditto	1 1 0
Produce	15 0 0	Hoeings and beer	0 9 0
Expence	15 12 0	Ten tons of dung	
	—	spread at 10s.	5 0 0
Profit per acre	1 8 0	Five tons of lime,	
	—	spread at 20s.	5 0 0
		Expence per acre	13 12 0
	—		—

WORCESTERSHIRE.]

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But if the tenant pays poor's rates, the profits will be reduced low enough, unless he gains a greater produce than above estimated. The barley straw will pay well for harvesting, which is, I believe, to be carried off.

An omission is made in the above estimate of two ploughings for the barley, and harrowings, as well as weeding, which together will be 30s. per acre; also the seed barley is not reckoned; the produce must therefore be put at 30 bushel per acre, over and above the seed.

3. TITHES.

Tithes are of great antiquity, having, it is said, been settled in England since the year 786; and they were certainly much less a grievance formerly, when rent of land, labour, and taxes, were next to nothing, than at present, when those particulars are advanced as near their utmost limit as possible, and the grower of corn is forced into calculation, or he will find the balance on the wrong side. I consider the tithe of corn to be now much the same hardship, with the tithe of a finished article of manufacture.

The ancient enclosures are generally titheable, but in the modern ones the tithe has been sometimes commuted for (but not always by) an allotment of land to the rector, or other tithe-owner, in lieu of such tithes. This should certainly always be the case, but in some instances the tithe-owner has refused his consent to such exoneration, and the enclosure has gone on subject to tithes; this must be owing to perverseness or wrong information; every person of sound mind, and good disposition, must prefer solid property in land to

to tithes. It has been argued on behalf of the clergy, that, by giving them land, you secularize them, and force them into worldly concerns, which is said not to be the case with landed produce ready prepared to their hands ; but this is mere affectation ; few, even of that order, are so abstracted from the world as to be incapable of attending to the common concerns of life, and should that be, in any particular instance, the case, a landed estate is as easily managed by an agent as the collection of tithes. Many clergymen are practical farmers beyond their glebe, of which I do not disapprove, and some are even stewards to noblemen and gentlemen of large fortune ; and from their education and connections, they are certainly more likely to introduce improvements than an illiterate farmer ; and may find time enough over and above such avocations for the necessary attention to their professional duties. Dr. Nash, very much to his honour as a church dignitary, expressed to me his approbation of commuting tithes for land, and thus removing the bickerings, ill will, and uneasiness, which often arises between the rector, or tithe-man, and the farmer, upon the latter being obliged to relinquish a part of that produce of the land raised by his labour and industry. The practice of giving an allotment of land in lieu of tithes, ought to be general in all acts of enclosure, and it would be still better if the commissioners were directed to make an allotment of land in lieu of tithes in the old enclosures. Dr. Nash says, "the getting rid of tithes, is a thing much to be wished by all, generally advantageous to the occupier, and though not always profitable to the rector, yet certainly for his ease and happiness."

I understand that the tithe of hops is more complained

plained of, and deemed a greater hardship than even that of grain, as being an article raised at more expense and with greater labour ; this is a proof that as the cultivation of corn becomes more operose, and is carried on with greater care, attention, and consequent expense, the consequence of tithes will be still more severely felt ; and unless some method be taken to get rid of them, the effects arising from them will increase, with an improved agriculture.

4. POOR'S RATES.

In the reign of Charles II. the poor's rates for the city and county of Worcester were 10,640l. the amount of the same throughout the county is stated by Dr. Nash, in 1776, to have been 26,906l. 7s. 5d. In 1803 it was advanced to 87,307l. which was also then estimated to have been at the rate of 5s. in the pound, but this upon a nominal value ; the total poor's rate throughout the county is now, 1807, probably near 90,000l. per annum, and the actual annual value of the county 600,000l. whence the poor's rate upon the actual full annual value is 3s. in the pound, and upwards of 12s. per head on the whole population.

It is a general idea, that the establishment and increase of manufactures occasion an increase of poor's rates, and thus become a burden upon the landed interest of the neighbourhood ; but I believe this evil is generally more than counterbalanced by an increasing consumption of, and demand for, landed produce at market.

The following particulars of the poor's rate of the parish

parish of Bromsgrove I had from Mr. C. an inhabitant of the parish, which contains 14,000 acres, and 6,000 inhabitants, more than one-half of which are supported by manufactures; in 1801, the poor's rates were risen 6,000l. they are now, 1807, or were the last year, about 3,500l. this is 5s. per acre upon the land; but reckoning upon 500 houses in the town, and some of the land being valuable, does not much exceed 3s. in the pound, upon a full value. A farm of 450 acres, two-thirds of it modern enclosure from the Lickey, pays now annually about 3s. per acre; the poor's rates of this parish therefore nearly average with those of the whole county, being rather more than 3s. in the pound upon a full value, but rather less than 12s. per head upon the whole population.—See *Poor*.

5. LEASES.

"The leases commonly granted are for twenty-one years, but many according to circumstances, and the opinion of the proprietors. Covenants ought and do restrict tenants from getting more than three crops, without a clean summer fallow. I do not see how a rotation of crops can be properly laid down in leases, for often when a wheat or bean crop has failed in spring from the grub or otherwise, I have seen spring crops put in successfully upon one ploughing; but the farmer should be confined to spend the whole produce on the premises, manage and depasture properly, and to leave the farm at the expiration of his lease, in such a situation as will be a fair entrance for a succeeding occupier."—*Mr. Oldacre*.

"Leases are by no means general, but when a tenant takes a farm in our open fields, he holds it by custom for four years, and there is the greatest reason why this custom should be lawful, where three crops and a fallow conclude a round of four years, and he has a crop of all the different grains, and gets his average, his entrance is on the green and fallow at Lady day, being deprived of a crop the first year. There are some leases on our enclosed farms in Marshall's Minutes on Gloucestershire and the Vale of Evesham; I supplied him with a lease I then conceived well drawn, it is there copied and may be referred to."—*Mr. Darke, Bredon.*

Mr. C. thinks leases should always be short and explicit, and that from 50 to 100 lines are enough upon any occasion. The principal covenant should be, 1. the lease not to be made assignable, except to wife or children, without the landlord's consent; 2. no maiden tree or sapling shall be lopt, cut down, or cropt more than half way to the top, under a severe penalty; 3. old pasture or meadow land of a good quality, should, on no account, be ploughed up; 4. all arable land should once in six or seven years, have a clean and complete fallow, either for grain or turnips, and remain two or three years at grass, after each and every tillage; 5. instead of being compelled to spend the whole produce of hay and straw on the premises, the farmer should be permitted to sell such produce, laying out the whole money in muck, lime, or other manure, to be laid on the premises; 6. new buildings necessary should be done at the landlord's expense, the tenant paying a yearly interest for such accommodation.

"It has been observed, that there is an objection among the proprietors in general of this county, to the granting of leases. An ill-grounded jealousy on

"the

“the part of the landlord, and the frequent disputes, and
“law-suits, occasioned by the present vague mode of
“drawing up these covenants, and the difficulty or trou-
“ble of drawing them up in such manner, as to adapt
“them properly to the peculiar circumstances of each
“farm, are the principal source of this opposition.
“Those granted, are generally for twenty-one years,
“determinable every seven, at the option of either
“party; some for shorter terms, and determinable at
“shorter periods. The land-tax and repairs are paid
“by the landlord. He reserves the timber trees. The
“restrictions by which the tenant is bound, are, not to
“break up the meadow or old pasture grounds; not to
“sow more than a certain quantity of the tillage, and
“that proportioned to what he may be supposed to be
“able to manure properly with the produce of the
“estate; to spend all the hay, straw, green fodder, and
“dung, on the premises; or if hay or straw are sold, to
“procure a proportionate quantity in return, and to
“leave the farm in a proper course of husbandry. These
“are the general clauses by which the tenant is bound.
“Others, in some instances, are introduced, adapted to
“the peculiar circumstances of the estate, but they are
“not such as can convey general information.”

“That leases, and those for a long term must tend to
“the improvement of agriculture, is the opinion of the
“occupiers in general, and of many proprietors: where
“any considerable improvements, such as draining, wa-
“tering, marling, planting, &c. are to be made by the
“tenant, *they are absolutely necessary*; and it appears the
“objection on the part of the landlords might be reme-
“died. That state of independence in which a long
“lease is supposed to place the tenant, is no longer a
“grievance, when he does his duty by the farm; it is
“from

“ from the negligent or dishonest occupier alone, that
“ any thing is to be apprehended ; and, could the present
“ tedious and expensive course necessary to eject the tenant,
“ not complying with the conditions of this agreement, be
“ altered, and the proceedings be conducted in a more sum-
“ mary way—perhaps by a verdict of twelve neighbours,
“ before an adjoining justice—this difficulty might be
“ wholly removed. Those misunderstandings also,
“ which arise where nothing dishonest is intended by
“ either party, would be greatly diminished, were the
“ simple language of common conversation introduced,
“ instead of the present circuitous and intricate language
“ of the law. The difficulty and trouble of framing
“ leases adapted to the peculiar circumstances of each
“ farm, would not, perhaps, be found so great, as at first
“ sight they may appear to be : one form, drawn up by
“ a person well acquainted with the business of a
“ neighbourhood, might, with little variation, serve
“ a considerable district. The principal source of this
“ objection seems to be this, that leases are in general
“ drawn up by professional gentlemen, who, having but
“ few opportunities of more minute information, are
“ under the necessity of copying from those who have
“ gone before them.”

“ As no sufficient proof has been yet adduced, that
“ fallowing is not necessary to keeping the land in good
“ condition, the clause obliging the tenant to fallow a
“ due proportion is a necessary one. To fix a rotation
“ of crops, must subject the tenant to inconvenience and
“ loss. The number of years for which convertible land
“ shall be grazed may be fixed with more precision ; but,
“ even this, from the uncertainty of seasons, may subject
“ the occupier to injury.—*Mr. Pomeroy.*”

6. EXPENSES AND PROFITS.

Respecting the expense and profit of agricultural employment, it cannot be expected that any minute detail of real accounts should be gone into, as few, and perhaps no individuals would chuse that their domestic accounts should meet the public eye; this subject can therefore only be treated in a general way, and from the apparent circumstances of practical farmers. The produce of the land is of such universal and absolute necessity to the existence of mankind, that it is not reasonable it should yield to him who raises it more than a fair profit, and this must always be the case from the competition occasioned by those articles being in numberless hands; so that little more can in general be expected to be got by farming than the price of labour and interest of capital. If the price of landed produce has advanced of late years, rents, taxes, and the price of labour have kept pace, and the general circumstances of farmers will be found but little improved; yet the situation of different farmers like that of other classes of men, will be various from different exertions and causes; the small occupier, with a small capital and no other resource, will seldom rise to opulence; some little advantage arises in this county from fruit, as the domestic beverage comes duty free, but in the articles of cyder and perry for sale, I believe much more is gained by the merchant than the planter; and the same will hold good in respect to hops, which, in a plentiful year, are sold for little more than the amount of duty and labour; it is therefore by those alone whose opulence enables them to keep the produce of plentiful years for the demand of scarce ones, that any thing considerable is gained by these articles.

CHAP.

CHAPTER V.

IMPLEMENTS.

In the north-east parts of the county, upon the mixed gravelly soils, and in the north parts, upon the sandy land ; the same kind of ploughs are used as in Staffordshire and Shropshire ; being a two-wheel single furrow plough, drawn by three horses, and requiring a driver but no holder, except to turn it out and in at the end at turning, which the driver can easily manage ; or a two furrow wheel plough, upon similar principles, which one man can manage both as holder and driver, but has sometimes a boy to assist : this latter is drawn by four or five horses, will plough two acres per day or more ; the former half the quantity.

In the Vale of Evesham and elsewhere, the turf plough is used for breaking up turf land ; this plough has two shares, one before and above the other ; the first takes off about an inch of the turf and turns it into the furrow after the horses, the next share about eighteen inches behind, throws on the top of the turf a clean furrow of mould about five inches thick. Land thus ploughed works with the harrow nearly as well as fallow land.

"The sort of plough in general use here, is the common straight heavy plough without wheels, as is peculiar to the Vale of Evesham ; many other sorts have been introduced, but none found to answer. Six inch wheel carts, and three inch wheel waggons like most other counties." —*Mr. Oldacre.*

Mr. Darke " says the ploughs are natives, and such as are seen nowhere but in the Vale of Evesham ; I use them

"them as my father did before me; they are of wood, except the share and coulter; very long in tails throck, and shelve board; a load for a team."

I believe that this strong tenacious soil, requires to be cut with a more acute angle, than a common or gravelly soil, and that whether wet or dry; when wet the soil would not slip or separate from an obtuse angled plough. Other neater looking lighter ploughs have been tried without success, and this uncouth looking tool maintains its ground.

Mr. Pomeroy observes, "the plough is said to have undergone considerable alteration within these last twenty years. The one in general use, at present, is the hammock plough. Of such as are peculiar to the county, the double plough, which is said to be a native, is still confined to the lighter soils, to the north. A second, is the string plough, composed chiefly of wood; its beam crooked, body long and weighty: this, as far as relates to general use, is now almost exploded; it is, however, still found convenient on the deep red soils intended for hop-grounds, on the Teme side, which are prepared for that purpose as follows:— Two of these ploughs, with a man and boy to each team, are employed, following each other; in every other respect the same, they are differently furnished with iron work; the first, which takes off the sod from two to four inches deep, has the wing (here called the feather) of its share extended, and formed into an edge, which terminates with its point on the right hand side; in this position, it separates the upper from the under roots of the grass. In this plough, particular attention to the edge of the coulter is also paid, that the undermined turf may be so regularly cut, and equally divided, on the surface, as to afford the shield-board, which

" which follows an easy opportunity of raising it on its
" edge, and then laying it flat on its back in the furrow
" —in that which follows, both the share and coulter re-
" semble those which (here) are in common use, with the
" point of the former tending a little downward ; this
" following, raises the soil from a considerable depth, and
" covers the whole. A third, is the large straight heavy
" plough, more especially peculiar to the Vale of Eves-
" ham ; rather long in the body, and without wheels.
" On the Cotswold Hills, a plough with one wheel is
" seen, much on the same construction as those met with
" in Devonshire, and other western counties. At Cuts-
" den, considered as part of these hills, oxen are worked
" two abreast. Most of the modern improvements are
" adopted on the lighter soils."

The harrows are of the usual construction; the wag-
gons and carts remarkably heavy ; those on the Cottes-
wold Hills lighter.

The sickle for cutting wheat, said to have been in-
troduced about the year 1750, is now in general use.

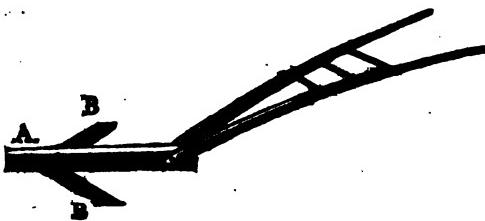
The Worcestershire common plough (Plate III.) used upon light soils, drawn by two or three horses ; a similar one making two furrows is drawn by four or five horses, according to the nature and melioration of the soil.

To prevent confusion the right hand tail is not re-
presented. The common plough, (No. 1.) guided by
the wheels, requires no holder, except to turn it out and
in at the ends of the field ; this plough works well in
sand, gravel, or dry soil ; resting in the furrow upon a
base about 3 feet long, and spreading the soil to about
18 inches wide, it cuts the earth with an angle of about
30° which is too obtuse for clay, or moist loam, of which

it will not clear itself, unless the base and shelboard were lengthened.

No. 2. Vale of Evesham plough has no wheels, nor iron work about it except the share and coulter; the length from the point of the share, to the hinder end of the shelf board is 6 feet or more; it spreads the furrow as before 18 inches, and cuts the earth with an acute angle of about 15° , it requires a holder, and in this tenacious soil no plough can do without, it being liable to suck into the earth in moist places, and to leave the ground and break out in dry places, or when the land is not sufficiently moist.

The shim is also in use, consisting of a strong plate of iron, bent on its fore edge, to an obtuse angle, and made sharp so as to cut up stubble weeds, &c.; it is furnished with handles to guide it, and drawn by one or more horses.



A, the line of draught.

B B, the fore edges of the plate, which shims off the surface of the land.

Schiffliers, or cultivators; also the common and spiked roller, are occasionally used in Worcestershire; drill machines are introduced and pretty much in use; there are several makers of them in and near Evesham. Richard Arkles, of Great Hainton, near Evesham, makes drill machines for wheat, barley, oats, vetches, or pease; laying in three rows at from 6 to 9 inches,

at

at 5 guineas each; the same for beans or pease in two rows at from 1 to 2 feet, at 4l. 10s. they are used on all sorts of land, and their use is increasing; he has made them for seven years from their first introduction, and now makes thirty a-year. They deliver the seed by means of a cast iron pinion, or voluted cylinder, not furrowed straight along the cylinder but obliquely, and the delivery regulated, and the furrows of the cylinder kept clear, by means of a brush. I examined several of them, they are neat and compact, and seem adapted to perform their business properly. Those made in Evesham are upon the same principle; a leader, a holder, and one horse, will drill two acres per day.

Mr. Knight, of Lea Castle, Wolverley, uses drill machines made in the north, I believe in Scotland, for wheat, barley, vetches, and turnips.



Carrot drill.—Mr. Knight also uses a carrot drill of the annexed form, not for sowing the seed, but for making drills, in which the seed is sown by hand. It is drawn by a machine, and makes three drills at a time, two of which are sown by women following, the vacant drill is occupied by one of the fangs of the implements on its return, thus gaging the distance: the drills are made twelve inches asunder.

I find upon farther consideration, and upon a review of Mr. Knight's premises, that his drill machines for sowing turnips are of the Northumberland construction, as introduced by Messrs. Bailey and Co. and the same construction

construction is in use in many other places ; those made in the Vale of Evesham are an imitation of them, and appear to me to be quite equal to the original.

The barley drill used by Mr. Knight was made in Hertfordshire, and is distinct from the turnip drill made in the north ; it lays in four rows at a time at ten inches distant.

Horse hoes are used for the drilled turnips, but other crops are sown too close in the rows to admit of it, and there are no scarifiers attached to the Hertfordshire drill ; the turnip horse hoe is a light plough with a mould board on either side, thus moulding two rows by being drawn between them with one horse, and will go over two or three acres per day.

THRESHING MILLS.

Mr. Knight has lately had one erected by Forrest, of Shiffnall, Shropshire ; a three-horse power called, but they have generally used four horses in working it ; the price was 88l. independent of the building ; it had only been tried for barley when I saw it, of which it will thresh out ten bushels per hour. It threshed about ten quarters of barley, September 28, 1807, in about eight hours.

Mr. Knight has also put up a chaff cutter, worked by one horse ; the knives, fixed in a wheel, forming nearly the radius of a circle, do their office by their rotatory motion ; this machine is by —— Burrell, of Thetford, in Norfolk ; the price 24l. at Thetford. It will cut, if the horse be put on briskly, near one bushel per minute, or easily 4 or 500 bushels per day, and will be applied here

here principally to the cutting of hay. Mr. Knight believes straw does not contain much nutriment, and I have heard an idea expressed by others that cutting, or otherwise eating large quantities of straw by live stock, lessens the dunghill without much improving, or indeed properly supporting such stock : good hay cut small will be clean eaten up, without any waste, either mixed with a little corn or alone. I am of opinion that his machine, from its good performance and dispatch of business, ought to be brought into general use.

The waggons, carts, and wheel carriages of this county, have nothing peculiar in their construction, but are made of strength and weight in proportion to the uses for which they are meant ; those for the road and for heavy loading being strong and weighty in proportion to the burden they are intended to bear ; I however, observed Mr. Knight's dung carts, to be of a neat, compact, and light structure, and some of the harvest waggons in the county have a similar merit, and are contrived for short turning, by means of a crooked, or arch formed side of the waggon at the fore end, splicing to the middle piece, and enabling the fore wheel to strike under the bed of the waggon, so as to turn round in a small compass ; and, indeed, nothing can be a greater instance of mismanagement than to have a wheel carriage unwieldy, or of a weight to over load the team ; for if the tool be too heavy, that strength is exhausted in wielding it, which should produce the effect ; the lightening therefore of wheel carriages, so far as is consistent with the necessary strength, is an object of great importance in rural economy.

THE FOUR-WHEELED TROLLY

Is common over Severn; consisting of a bed resembling a small waggon, mounted on four wheels, with poles for harvest, or other top loading mounted on it, the whole constructed low, the leading wheels being only 3 feet high, the hind wheels 3 feet 6 inches, very convenient for conveying ploughs, harrows, or other implements, remnants of harvest, fire wood, faggots, or any thing; the whole being light and forming a waggon in miniature, and may be drawn any where by two or three horses, and is found very useful and convenient. A similar carriage, on low cast iron wheels, is much used in the city of Worcester, for carrying coals, hops, &c. from the wharfs, about the town.

The sledge with hind wheels, the fore part sledging on the ground, is used west of Severn for conveying ploughs, harrows, &c. I think this implement much inferior to the last.

Winnowing machines are in use; those by Cornforth, Chapel, Ash, Whihampton, generally preferred: price from 6 to 7 guineas. The common labourers' tools have nothing singular; rakes, hoes, spades, shovels, &c. are in use; but as far as I have been able to observe, without any peculiarities, and their form and manner of using them every where generally known.

As the foregoing account of ploughs was drawn up before I had an opportunity of particularly noticing Mr. Knight's implements, I beg leave to add that his ploughs are somewhat different in principle to those before described, they resemble the plough, No. 1, but have no wheels, and are light in construction, they are drawn by two horses abreast, and the man at the plough tails, guides the horses at the end by small in

traces. Quere, What are the certain mechanical advantages of drawing double? Does a wheel plough go heavier than a hand plough? If not, are not wheels and no holder, better than reins and no driver? Mr. Knight's ploughs are managed in a manner similar to those of Norfolk, but of different construction, being light swing ploughs without wheels; but it ought to be observed that the soil is a light sand, or sandy loam, and certainly can be worked with much less strength than clay soils.

Respecting other implements, borers and draining tools are well known, and should be at command; the former consists of a large auger, with screw rods to lengthen it, and a proper head or handle to force it round, besides which there must be a long line, paring knife to cut through turf, and digging tools of different breadth and formed tapering to follow each other, a scoop for cleansing out the bottom of the drain, and scuttles or baskets for conveying materials to fill it up.

WEIGHING ENGINES.

These are common as attached to the turnpike roads, but for weighing cattle I saw but one in the county, which was at Mr. Smith's (Erdiston). It was made at Ludlow, in Shropshire, by a person who makes them to weigh carriages, or cattle, or both on the same machine; price for cattle alone 10l. 10s. for carriages, also 15l. 15s. I was not able to procure any authentic accounts of the proportion of live and dead weight.

An implement rather peculiar to this county, called a kerf, is used in the hop grounds, for moulding up the young plants; it is a strong and heavy hoe, the size and weight about equal to the bit of a common spade.

I shall

I shall conclude this article with a list of implements from Mr. Carpenter's Agriculture, lately published, who is a Worcestershire farmer, and who advises every farmer to have such things in a place of safety ready for use.

Waggons and carts, ploughs and harrows, a proper assortment; sickles, weeding hooks and tongs, forks and pitchforks, rakes, sledge, roller, hopper, scythes.

Meadows and Pastures.

Pitchforks and prongs, hay cutting knife, dung and mole-hill spreaders.

Barn and Stables.

Flails, ladders long and short, winnowing machine, measures for grain, sieves, brooms, sacks, scuttles, buckets, curry-combs, mane-combs, whips, harness for horses, goads, harness and yokes for oxen, panniers, packsaddles, bridles, saddles, surcingles, side-saddle, cart ropes, and corn screen.

Other necessary Implements.

Wheelbarrows, handbarrows, hammer and nails, gimblets, saws, pincers, scissars, axe, &c. Hedging hook, ditto mittens, garden roller, grindstone, whet-stones, beetle and wedges, hurdles, iron leaver, sheep, and hedge-shears, hoes, hog-yokes and rings, geese-yokes, scales and weights, marks for live stock, spades, shovels, &c. Elkington's borer for under draining.

Mr. C. remarks, "He that goes a borrowing goes a sorrowing," and so often does the lender of implements by having them sometimes spoiled, or in not finding their way home again; and though it would be un-neighbourly to oppose, or object to lending or borrowing upon urgent occasions, yet he recommends to make a trade of it as little as possible.

CHAP. VI.

ENCLOSING, FENCES, GATES.

THE greater part of this county is ancient enclosure, the fences being often full of timber trees, particularly elm, of which this county produces the finest in England; the fence itself is here often composed of smooth wood, as elm, willow, and hazel, as well as of crabtree and hawthorn.

In the middle, south and west of the county, fruit trees are often interspersed in the hedge-rows where they apparently do little harm, and sometimes yield a profusion of fruit; this seems to be an useful and valuable article obtained without loss of premises.

The modern enclosures are made of post and rail, and sometimes two rows with mounds, and a quickset fence planted between. The modern quicksets are the white hawthorn without any admixture of smooth wood; but some mix crabtree and holly.

The ancient fences are renewed, by moulding up and plashing; the gates are generally made of oak sawn or clefted, no introduction of willow, to supply the place of oak; which latter, being the most durable, makes a saving in labour.

The modern enclosures have been partly from waste and, and part common fields. The greatest waste and enclosure is that from Bromsgrove Lickey, which has consisted of some thousand acres, formerly covered with

with heath, furze, and fern ; but now with good crops of turnips, clover, potatoes, and the various kinds of grain ; upon a high tract of sandy gravel, part of the crops now growing, little harvested, and some not ripe : September 7, 1805.

Part of the Vale of Evesham, and some other rich common fields are of modern enclosure. Dr. Nash observed to me, that the enclosures in Worcestershire have tended to lessen the growth of grain ; this will always happen in the case of the enclosure of rich common fields, so long as the demand for beef and mutton occasions those articles to pay as well or better than grain ; but the improvement and national advantage, from the enclosure and cultivation of barren waste land, cannot be called in question ; their produce of grain is so much superior in furnishing food and employment for mankind, to that of or from the half starved sheep formerly depastured thereon, that no question respecting the improvement or public utility can possibly arise, except indeed in the case of neighbouring poor cottagers who often lose privileges formerly enjoyed. Dr. Nash observed farther, that such enclosures had often been a bad speculation to the proprietors, and where they had paid well, it was chiefly because the land had been under-let before, and was afterwards advanced to its value.

From these and other considerations, the following I think may be adduced, as maxims of sound domestic policy : That the enclosure and cultivation of barren waste land (due regard being paid to the privileges of the poor) is always a measure of public utility ; 2. that the enclosure of rich common fields is a measure of doubtful utility, because by being thrown to grass,

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they will afford less food and employment for mankind than in the present state.

And the probability is, that such land, if its staple be good enough to form a rich feeding pasture, will be thrown to grass, because rich pasture land is managed with so much less trouble and expense by the occupier, and generally pays him better.

According to my calculation the produce of an acre of good land, in beef or mutton, will be consumed by an individual at a moderate allowance in a year; but the produce of an acre of wheat from good land, will serve four persons for a year.

Mr. Oldacre says, "in regard to new enclosures, I have known farms not worth the old rent after an enclosure, and I have known others nearly double the rent; but this must principally arise from the high or low price they were let at before the enclosure took place: it can hardly be said to have paid common interest for the expense attending it in this neighbourhood. Where a proprietor had several small farms, to save the expense of dividing into small pieces, and repairing a number of old buildings by turning the whole into one, he may perhaps find an advantage. In poor lands, when enclosed, the quantity of corn will increase; but in good land, the quality will be injured by the fences, and the quantity not increased, but most likely, by converting to pasture, diminished. There is certainly an opportunity to improve stock by enclosing."

The size of enclosures varies, most farmers wish to have their land divided into eight or ten parts, or more, according to the nature of the soil. The expense of first planting and fencing the quick will be about 9s. the perch of eight yards running; and the expense

in cleaning and repairing about 3 or 4s. more. It is reckoned to take about five years rent to enclose a farm.

In the Vale of Evesham, enclosures have very much decreased population; and every year will have still less occasion for labourers; this will be more the case where the farms are converted from small into large ones; but where large commons and waste lands are enclosed, it must tend to increase both the growth of corn and the population.

Mr. Darke, who is very enthusiastic for enclosures, observes, "The parish of Bredon consists of seven hamlets, five of which are in open fields; the soil various, near one half bears turnips tolerably, the other parts gravelly clay, or loam, with pebbles. Situation, exposed to the south-west, having few intervening hills between and the Bristol channel; the west end of Bredon Hill is about three miles from Tewkesbury, Gloucestershire, the southern part of the parish runs up within one hundred yards of that town. The Earl of Coventry has six hundred acres of enclosed land at Mitton in a ring fence, scarce to be equalled in richness and fine produce; to this farm the plough is a stranger, the soil a black loam; the parish is bounded for five miles on the west by the navigable river Avon, and by the river Carran for three miles on the east."

"I have every reason to speak in praise of enclosures; about twenty years back, I obtained an act to enclose a parish in Gloucestershire, of strong clay land, my allotment was 453 acres, which averaged about 8s. per acre, and will now bring upwards of 80s.; we must allow some part of the increase to the times, but the improvement is greatly owing to its turning from indifferent arable to most excellent pasture. Before the enclosure

56 ENCLOSING, FENCES, GATES.

enclosure the cattle and sheep were infamous ; they are now of the best quality.

" The mixture of property in our fields prevents the land being drained, and one negligent farmer, from not opening his drains, may injure the lands of ten who lye above, to the very great loss of his neighbours and the community ; add to this, that although our lands are well adapted to sheep, yet, for want of good draining, out of one thousand pastured in our open fields, not more than forty, on an average, are annually drawn out for slaughter ; rot, scab, &c. sweep them off, which would not be the case if the land was drained, which is the principal and first good effect from enclosures. In our unenclosed hamlets the meadow and pasture are fairly proportioned to the arable, which latter is by computation 1600

Pasture -----	1300
Meadows on Avon	800
<hr/>	
3708 acres.	

" There are besides 500 acres of commonable lands which are of little or no use, being over-stocked produce a beggarly breed of sheep, of little use to the owner, for being constantly brought off the high lands in autumn, to pasture and feed on the land subject to floods, they there receive their bane, and that produce is prevented which might assist population and commerce."

Upon the whole, I think it pretty clear, that the enclosure of rich common fields tends to lessen the produce of grain, and to diminish the agricultural population ; at the same time it gives an opening for improving, and greatly increasing the value of the land ;

improving

improving live stock ; and increasing the produce of butcher's meat, hides, and wool ; which last being staple commercial articles, find employment for an additional population in manufacturing articles which are sure to find a market.

I remember the late Jos. Wilkes, Esq. of Measham, Derbyshire, who was a deep thinker, and well acquainted with commercial and political, as well as agricultural economy ; maintained in a time of scarcity, that it was a less evil to import grain, than the raw materials of manufacture, particularly as such grain was paid for by the export of our manufactured goods.

Mr. Pomeroy says, "the lands are in general enclosed ; here are, however, some considerable tracts in open fields, the most extensive are in the neighbourhood of Bredon, Ripple, and to the east of Worcester. The advantages from enclosing common fields, have been evidently very considerable ; some few objections have been started, but they do not appear, on the whole, to have considerable weight : the rent has always risen, and mostly in a very great proportion ; the increase of produce is very great, the value of stock has advanced almost beyond conception ; in one parish alone, where the quantity enclosed has been pretty considerable, it is stated, on unquestionable authority, to have amounted, in sheep and wool only, to full 1000l. a year. The improvements that may be made in stock in general, if properly attended to, are too obvious to be insisted on : it may be said in general terms, that there is but one opinion throughout the county on this subject ; indeed it is in enclosures alone, that any improvement in the line of breeding in general can be made.

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"The average size of the enclosures, is from fourteen to twenty acres, but varying considerably according to the size of the farms ; the greatest part of the old enclosures is under this estimate.

"The new fences are chiefly made with hawthorn, secured by post and rails ; on the Bredon and Cotswold Hills they are of stone. The expense of making them is difficult to judge of with accuracy ; but from the supply of materials, which are in most parts plentiful, it may be deemed moderate.

"If a doubt is admitted, whether enclosures increase or decrease population, it must depend in this, as in other counties, on the nature of the land enclosed. Where waste land is enclosed, it must obviously increase population ; there can only be a doubt, when the question arises respecting common fields. The enclosures in this county have been chiefly of the latter sort, and yet the population is admitted to have increased. Considerable enclosures have been made of late, some by authority of parliament, others by mutual consent of the parties interested in them ; more would certainly take place were it not for the expense which attends procuring acts of parliament for that purpose."

Respecting the improvement, by enclosing barren waste land but one opinion can prevail. Mr. Darke observes, in this case, "The advantages are innumerable, to population as well as cultivation ; and instead of a horde of pilferers, you obtain an useful race as well of mechanics as other labourers."

The following particulars respecting the enclosures lately made in the parishes of Bromsgrove and Bell-broughton, were given me by Mr. C. with whom I viewed the premises the beginning of August, 1807. By one of these enclosures, in 1794, 300 acres were added

added to his occupation of Chadwick Manor, which before was 150 acres of old enclosure; the soil is a pebbly gravel, or gravelly loam, on a sandy under-stratum. Situation and aspect rather elevated.

Lickey enclosure, 2 to 3000 acres, under two different acts of parliament cost 3l. per acre, at least in solicitors, surveyors, and commissioners expenses, besides enclosing, which costs 5l. per acre more. Total 8l. per acre.

In this enclosure the rights of the poor were respected, and the established cottagers had their land allotted, and where confirmed in possession.

Bourn Heath, Bromsgrove, 60 acres enclosed, 1802, about twenty cottages existing thereon had their land enfranchised, and now live comfortably on their own premises, with well cultivated gardens, potatoe ground, and pigs, but no cows.—See COTTAGES.

Bellbroughton, Madeley Heath, Bell Heath, and Wildmoor, enclosed 1802, about 500 acres: expenses the same as above. Wildmoor, a deep peat, has been drained, and has produced excellent potatoe crops three years together; oats growing there August 5, 1807, not less than 50 bushel per acre.

These enclosures were made with post and rail and hawthorn quick. Mr. C. advises and used one crab quickset in a yard, on which fruit may be grafted, and a sprinkling of holly to fill up the bottom.

According to Mr. C. the gravelly waste lands were thus best reclaimed. 1. Pare and burn for oats, potatoes, or rye. 2. Lime 4 to 6 tons per acre for turnips. 3. Autumn wheat, or spring wheat, or barley with seeds, then sheep pasture for two or three years, with tender cropping upon again breaking up, otherwise the land will

will revolve to a state of sterility; the paring and burning cost from 42s. to 50s. per acre.

The peat land of Wild Moor will bear more cropping, but there is danger of carrying this too far. Oats and potatoes have in some instances been already three times repeated, the land seems adapted to hemp, which Mr. C. says it would well bear, but would answer better permanently, to clean well by a turnip fallow and lay down with proper seeds for permanent meadow.

Respecting rent or profit, the enclosing and reclaiming of indifferent waste land, is no very profitable speculation in general; nor can be expected to pay much more than interest of capital in addition to its former value as waste; but the produce of food for mankind is certainly very much increased; and as a public measure the enclosure and improvement of waste land cannot be too much promoted and encouraged. Mr. C. says, quicksets for enclosures, should be three years and a half, or four years old when planted, from the time the berries are gathered; the roots should be pruned of their superfluous fibres when planted. If these cuttings from the roots be placed in regular bunches, and planted in rich mould in rows one inch apart, and nine inches between each row, and kept clean from weeds, in two years these fibres will produce as good quick as those from the berries in four years, one thousand of quick so managed will give six or seven thousand, or more, if it be strong and kind in the root. The thick part or upper end of these cuttings should be just slightly covered with fine mould; the fibres of crab quick will produce the same effect.

CHAPTER VII.

ARABLE LAND.

THE agriculture and cultivation of this county is more miscellaneous, and less subject to characteristic system, than that of most other counties ; the soil generally rich and fertile, answers well either to a general culture, to a more operose culture, or to grazing ; and any thing, or every thing succeeds that is conducted with skill and industry. Hence grain and pulse, hops, and the various kinds of fruit, garden herbs, and medical plants, the fatting of sheep and cattle, and the dairy, have all been cultivated with success, and each one succeeds in that course of management to which his taste and inclination leads.

SECT. I.—TILLAGE.

The well managed summer fallows have four ploughings, whether for wheat, barley, or turnips. "Some farmers put the dung on their fallows about Midsummer, and plough it in at the second ploughing, others upon the barley stubble for beans, &c. ; the last practice I think the best."—*Mr. Oldacre.*

In the land adapted for turnips, the wheat stubbles are often ploughed up in September and sown with rye

rye ; this being eaten early in spring by sheep, the land has three more ploughings for turnips.

Beans and pease and vetches are generally set or sown upon one ploughing of stubble or clover-sward. Barley after turnips should be upon two or more ploughings ; as no land unless such as is very light and sandy will work fine and well upon one ploughing after having been trod by sheep and cattle.

In general all tillage land will require as many harrowings as ploughings, unless such as is sown under furrow, or by a drill machine, or set by hand. The harrowings should certainly be given when the land is in a tolerably dry state.

PLOUGHING, FURTHER REMARKS ON.

Ploughing, as remarked under the article Implements, is generally performed upon the light or gravelly soils, by three horses and a driver, but no holder, with a plough guided by wheels, and which will easily plough an acre in seven or eight hours, or by a two furrow plough drawn by five horses, who will plough two acres in the same time. This plough may be managed by one man, but a boy to drive is sometimes allowed.

Mr. Knight, upon the light sandy loam of Wolverley, has adopted the system of two horses drawing abreast, and guided by a man at the plough tail by small in traces: these two horses plough an acre in the same time as the one furrow plough above named, with three horses. The ploughs they use are nearly the same with the Worcestershire plough, No. 1, but refined

refined and lightened, the wheels taken off, and made to cut the ground with a more acute angle, they are thus neat light tools not overloading the team by their weight. Mr. K. has adopted a mode of ploughing in some cases, which he has seen in Hertfordshire, called hacking, the object of which is to lay the land level. It can only be practised on loose, or broken soil ; in this mode the horses go twice along the same furrow, once to push the land side of the furrow a little into the unploughed land, and then back again to turn it into the thus opened furrow ; the ploughed land is thus left in small ridges from twelve to fourteen inches asunder, with small hollows between, and when harrowed across becomes almost perfectly level, more so than if done by a turn-wrest plough. This land will bear to lay perfectly level, as it wants no water furrows. A little hindrance is occasioned by this method, instead of an acre, two horses only plough three quarters of an acre per day. Mr. Knight is introducing an improvement by using cast iron shares, which he believes will answer, both in execution and economy. A new share weighing eight pounds will cost 1s. or 12s. per dozen, and when worn down they are worth half the money to recast ; this, he believes, will be cheaper than new pointing and repairing common plough shares.

2. FALLOWING.

A complete summer fallow for wheat on enclosed land is only resorted to occasionally, or upon cold wet lands, where it is supposed at times indispensable. All lands that are adapted for turnips are cleaned when

soul by their culture; and no person would think of fallowing such land in any other way, but the culture for turnips being the same, or similar, both in process and manure, as that upon a dead summer fallow; it is generally considered as, and called a turnip fallow.

On strong clay land fallowing for barley is more prevalent, as will be shown in the next article on the rotation of crops.

"In the common fields our custom or usage, time immemorial, has been three crops and a fallow; during the fallow year, the lands are a common pasture for sheep."—*Mr. Darke.*

Mr. Pomroy says, "the plough is generally observed on the fallows after rain, when the land is said to work well; and afterwards observes that one ploughing in dry weather is of more service than all that can be done in wet, and this, in most countries, would hold good; but I have been informed that in the Vale of Evesham, it has long been an established maxim, founded on experience, that fallows work kindly in wet weather; and in the case of ploughing wheat under furrow, it is reckoned no unkindly symptom to see the water follow the plough down the furrow."

As the use of fallowing is to destroy all kind of weeds, and clean the land, and as a whole season is lost, by the land being made unproductive for that purpose, what an infatuation it must be to defeat the purpose intended, by neglecting the fallows, and which, I am sorry to observe, is but too often the case; instead of early ploughing and harrowing to destroy the growth, the fallow is too often suffered to run to grass and weeds, which get to such a head as not afterwards to be destroyed, and the whole has the appearance of a slovenly and neglected sheep pasture,
instead

instead of a clean fallow. Where summer fallowing is practised it should be managed so as to clean the land, otherwise a year's produce is thrown away to no purpose.

Mr. C. observes thus, "when strong lands are become foul and impoverished, there is no other way to make them answer any good purpose than by making good fallows, to which should be added under drains, if wanted, with four ploughings at least, and sufficient harrowings; the first ploughing to be given in autumn, and after the second ploughing, and harrowing down in spring a good thick coat of lime about six tons to an acre, and if seeds be sown amongst the wheat the ensuing spring, the land will be so much the better and more improved; fallowing strong land at proper seasons cannot be left off, nor continual cropping introduced, without great plenty of manure, more indeed than can be had; fallows and rest at grass must therefore come in rotation."—*Mr. C.*

3. ROTATION OF CROPS.

No particular system is followed here; where turnips can be properly grown, it is sometimes:

1. Wheat.
2. Turnips.
3. Barley.
4. Seeds and pasture, one or more years.
Or, 1. Pease, or oats.
2. Wheat.
3. Turnips.
4. Barley.
5. Seeds and pasture at pleasure.

I observed clover in wheat stubbles several times, and believe the course here to have been,

1. Turnips, early eaten off.
2. Wheat, with clover sown on it in the spring.
3. Clover.

Mr. Pomeroy says, " except in the common fields, no particular rotation of crops prevails."

Mr. Oldacre, of Fladbury, describes the following as a common course of crops in his neighbourhood, where the land is in good condition, and too strong for turnips.

1. Plough with the turf plough, and set beans or peas.

2. Wheat, at one or more ploughings.

3. Fallow.

4. Barley, with grass seeds, viz. red and white clover and trefoil, five pound each to an acre, with about two pecks of ray grass; the latter I had myself given up till I found I was wrong. This is the practice on enclosed farms, where there is but a small proportion of meadow or old pasture, and it is usual to let the land lay as long as it will graze well, which will generally be for two or three years.

But where a farm has a sufficient quantity of meadow and old pasture land, the tillage is generally divided into four equal parts:

1. Fallow.
2. Barley.
3. Red clover without any mixture.
4. Wheat.

In this case the red clover is used principally for tying off with horses upon the land; or carrying green to the stable; the first practice is a most excellent preparation for wheat upon clay lands.

But

But part of the land is generally in this course,

1. Fallow.

2. Barley.

3. Beans, or pease, or vetches, according to the soil, or necessity for green crops. The eating of vetches upon the land is of infinite service to the following crop :—

4. Wheat. The custom is, in this system of husbandry, to manure well on that part of the barley stubble intended for beans and pease, ploughing in such manure.

Wheat, beans, barley, pease, oats, and vetches, the latter principally for green food, are the crops in general raised.

The unenclosed lands, which are but a small proportion of the whole, are cultivated according to ancient custom, one system is crop and fallow; that is wheat every other year. This system prevails only on poor land which lies a great way from the fold yard, so as to get no other assistance except sheep penning. Another custom is,

1. Fallow.

2. Wheat.

3. Beans, mostly practised on strong heavy lands, but the most general practice is,

1. Fallow.

2. Barley.

3. Beans, pease, vetches, or red clover.

4. Wheat.

But upon all lands that will bear treading with sheep, turnips are cultivated in great perfection, and have much improved light lands; and clover answers well upon all soils that are not very poor.

I never yet saw a farm of strong land, clean and in good

good heart unless summer fallowing was practised, in every round or succession of crops.—*Mr. Oldacre.*

Mr. Darke observes, “ that in common fields property being much intermixed, there can be little experimental husbandry, being by custom tied down to three crops and a fallow. Beginning with a fallow, the course is as named before,

1. Fallow.

2. Barley.

3. Beans, which always produce abundantly, or clover, or vetches, eaten off as green crops by horses tied with stakes and ropes made with the rind of witch hazel, a custom peculiar to the Vale of Evesham; and there are well informed gentlemen who highly commend this mode of husbandry.

4. Wheat, sown on the bean stubble, or vetch, or clover sward; and this mode invariably succeeds better than sowing it on fallow ground, a doctrine in general disbelieved by those who are strangers to the Vale of Evesham; so remarkable for its high ridges and deep furrows.

In the common fields of Eckington, and of Bredop, I observed large breadths of turnips, and of potatoes; these were good crops, well managed, and kept clean: if the potatoes were followed by wheat, and the turnips by barley it gives a course as follows:—

1. Turnips.

2. Barley.

3. Clover.

4. Potatoes.

5. Wheat.

Such a course well managed, upon land of sufficient staple to bear it, would furnish an abundant supply of food for man and beast; and perhaps no course of

field

field culture could excel it in value of produce, which would almost rival that of a kitchen garden; but to support this, and ensure full crops, there must be a combination of two at least of the three following circumstances:—1st, good land; 2dly, good management; 3dly, plenty of manure.

DRILLING.

The drill husbandry is well known and fairly introduced, but is mostly practised on the hills and lighter soils, and chiefly for barley; it also answers well for pease, and I observed vetches laid in with the drill: beans are preferred to be set by hand. Some little wheat is drilled, but generally sown broadcast in the vale. There are two makers of good drill machines in Evesham.—See IMPLEMENTS.

Respecting the common field husbandry, I must beg leave to observe, that it is, in my opinion, the least improved, and in general the worst managed, of any part of British agriculture; naturally calculated, and particularly upon soils of a good staple, to raise large quantities of grain. The fallows are generally neglected, the weeds suffered to flourish and disperse their seeds, the drainage omitted, the roads left scarcely passable, and the general economy and arrangement conducted in a neglectful and slovenly manner. These evils might certainly be easily remedied by the influence of leading persons, but it seems as though each one neglected his share of the business, under the idea that if the field should be enclosed he would have a different plot of land; whereas, if each one improved

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and cleaned his share, he would be sure, enclosed or not, of a better lot. I have no doubt but the common fields, under good management, by which I mean clean fallows and proper drainage, would be greatly more productive.

Mr. Lucas, of Hanbury, complains much of the ruinous system of keeping land, that is enclosed land, in constant tillage, without any intermediate rest by pasturing; and observes, that instead of 10 or 12 acres in a hundred, 45 or 50 acres in a hundred should be at pasture, which being grazed for two or three years would acquire fresh nutriment from the dung of sheep and other animals: he names the following course as common in his neighbourhood upon the heavy soils.

1. Fallow.
2. Wheat.
3. Beans.
4. Barley.
5. Clover mown, sometimes a second time for seed.
6. Wheat, on the clover lay.

This is certainly hard tillage, and such as no ordinary land can support without extra assistance from manure.

Mr. Lucas observes, that it is weakly urged in favour of perpetual tillage, that the clover never makes its appearance after the first year, but dies away and disappears. This, he acknowledges, is not unfrequently the case, when it is sown on the third or fourth crop from the fallow, choaked up with weeds on an impoverished soil; but would not be the case if the land were fallowed and manured for a spring crop, as barley, and seeded down and pastured for two or three years.

As seed clover is a good deal grown in this country, and as it is an article of necessity, it might not be right

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to debar its growth. I approve very much of Mr. Lucas's idea after the growth of seed clover, which, however, should never be upon a second mowing. Clover for seed should be grazed to the end of the first week in June, should then be fenced up, and the field dressed over; when mown and harvested, to prevent exhausting the land, if it be too heavy for turnips, then fallow for barley with manure, and lay to grass with red and white clover, trefoil, and ray grass, and graze for two or three years; but if fit for turnips they will of course be sown, and barley and seeds may succeed as before.

The true system of Agriculture for the good of the community at large, is that wherein corn and live stock are made subservient to each other, and in which the greatest quantity of both is raised for the food and employment of mankind; a mere corn farm without useful live stock would be slavery, and a grazing farm without corn may be termed the luxury of agriculture; grain is so necessary for the support of mankind, and a given quantity of land will support so much greater a population than at grass, that it demands the first consideration. But the introduction of live stock to fertilize the land and increase the produce of grain is of the highest importance; every system of cropping which tends to beggar and exhaust the soil is to be condemned; grain is occasionally so scarce, that no system, that tends to lessen the quantity of produce, ought to be approved.

In a further tour through the county, in 1807, I had an opportunity of further observation and information on courses of crops, and therefore beg leave to add as follows:—

On all light and weak lands, Mr. C. is strongly of opinion, that grain should never be sown upon one ploughing of grass land, which he says always tends to foul the land and fill it with couch, but the course should be thus :

1. Plough up in August, and sow rye 2 bushels per acre, and vetches half a bushel per acre; this will be ready for ewes and lambs in April, stock hard and eat it down against the clover and ray grass is ready for the sheep; then plough and work the land well for turnips, manuring with muck, or lime, or both, then sow turnips: this the first year.

2. Autumn wheat may be sown on the turnip ground first eaten off; spring wheat in March upon such land as is then ready, and barley upon the remainder, with seeds upon the whole, red and white clover, trefoil, and rye grass; suppose half the land sown with wheat, and half with barley.

3, 4, and 5, years to August, sheep pasture, which completes the routine, and then begin again as before. Mr. C. says, that land thus treated and well managed, will never tire or become foul.

In this course, upon 100 acres arable there would be 10 acres of wheat, 10 acres of barley, 20 acres of turnips, 20 acres of rye and vetches for spring feed half a year only, and 40 acres the whole year, and 20 acres more to August for sheep pasture.

I objected to this as giving too small a proportion of grain, and particularly of wheat, so necessary to the support of mankind, and proposed thus alternately after five years as before; 6 wheat at one ploughing on the turf; 7 turnips on a complete fallow; 8 barley, with seeds; and 9, 10, sheep and pasture; and then begin with rye and vetches as before.

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In this course 100 acres, on the average would have 15 acres of wheat, 15 barley, 20 turnips, 20 ryé, and vetches half the year, and the rest sheep pasture; but Mr. C. objects to this, and maintains that the course he proposes will be both better for light land, and more profitable.

On the Lechmore estates, in the parish of Hanley, west of the Severn, upon strong or mixed loam, the following course is common:

1. Grass land ploughed, and beans set, or drilled; rye for sheep pasture sown immediately after harvesting the beans.

2. The rye grazed in April or May, then fallowed for wheat, and wheat sown in autumn. Lime freely used.

3. Wheat, with clover and grass seeds sown in spring.

Or where the land is somewhat milder thus:

2. Turnips, part common and part Swedish, the common turnips drawn early for stall feeding, and wheat sown; the Swedish kept on later, and fallowed by barley, making thus,

3. Part wheat, part barley, with clover and grass seeds sown on the whole in the spring, or sometimes, 2 winter vetches, succeeded by 3 wheat, and seeds in the spring.

Mr. Lechmore has this autumn, 1807, a piece of wheat of 8 acres, drilled in at about 7 inch rows, by one of the Worcestershire drill machines; the preparation was fallow; 1½ bushel of seed used per acre; 2½ bushels are sown broad cast, the crop is meant to be well hand hoed in spring. On good sound loams, light enough for turnips, no course can be more productive,

or

or more profitable than the following, which is often practised, but the land should be clean to begin.

1. A vetch, or potatoe crop; if vetches, to be sown in September, the true winter vetch; after Midsunmer, as the land is cleared of the vetches, to be ploughed up so as to make a partial fallow; unless the land be in good heart it should be manured for the vetches; if potatoes be planted, they should be kept very clean.

2. Year wheat. 3. Turnips, upon a complete turnip fallow. 4. Barley with seeds, and then at grass so long as may be thought proper or necessary.

Upon stronger soils vetches may begin as before, if the land be clean and in good heart; 2. wheat; 3. fallow; 4. barley, with seeds, and then at grass as before. But if land be foul with couch or weeds, it should begin with a fallow. Mr. C. advises in such cases, and the land being poor, to fallow for grass seeds only, and to sow them in August, which he knows by experience will answer, and restore the fertility of the soil by giving it rest at pasture; but I think a fallow should always be succeeded by some crop, even rye is better than nothing, and, if the land be very poor, an exertion should be made for manure or a top dressing.

In Sedgbury common field, the course is: 1. Fallow; 2. barley; 3. beans, or other pulse, or clover; 4. wheat.

In Bilhampton, and some other common fields that lie wide from manure, the course is crop and fallow manured only by folding sheep; it would certainly be an improvement to introduce clover, thus, 1. fallow folded; 2. wheat; 3. clover; 4. fallow folded; 5. barley; 6. clover, or vetches; and then fallow again.

Mr. Knight, Wolverley, intends the following course of crops upon his sandy loam, so soon as he can get his

his farm regular; extent 330 acres, meadow, pasture, and plantation, 90 acres; remain 240 acres arable to be thus disposed.

1st. year. Turnips, 60 acres.

2d. year. Barley, 60; or 50 acres barley, and 10 acres carrots,

3d. year. Clover, 50; vetches, 10 acres.

4th. year. Wheat, 60; or wheat 50 acres, and oats 10 acres.

Or, 200 acres thus; turnips, barley, clover, wheat, 50 acres each.

40 thus, turnips, carrots, vetches, oats, 10 acres, each.

Total 240 arable.

This will admit of some variations with the same result; thus, the carrots may be grown after clover, and the oats after turnips, also the wheat after vetches, and the oats omitted if thought proper. I think with Mr. Knight's spirited manuring and management, this is likely to turn out a very productive and profitable course.

CROPS COMMONLY CULTIVATED.

1. Wheat, the varieties generally grown in this county are the four following; 1. the red lammas wheat; 2. white wheat; 3. cone or bearded wheat, (the variety most common is that termed blue cone, which upon deep rich loams is superior to all others in produce); 4. summer or spring wheat, (triticum aestivum)

vam) the variety grown here is slightly bearded, though I am informed there is a variety of smooth eared wheat that will succeed and ripen well, spring sown.

The preparation in the common fields is generally fallow, but wheat is sometimes sown there after clover, or pulse, (i. e.) beans, pease, or vetches. In the enclosures, fallows for wheat are made upon cold strong land, and if such land be in a foul, couchy, and unameliorated state, such fallow is necessary; and wheat cannot be grown thereon to advantage in any other way. A fallow for wheat ought to be ploughed up in autumn, or in the winter months, cross ploughed in May, and well harrowed down, manured in June with lime 4 to 6 tons per acre, or muck 10 tons per acre, or both. It should be drawn up into lands in July, in which state it may lay through the harvest, when it should be again ploughed and harrowed in September, and in October may be sown with wheat under furrow. If these operations are regularly and well performed, the land will be in so meliorated a state, as not to require fallowing again for many years.

Wheat is also sown upon one ploughing up of a clover or other lay, or upon one or more ploughings of oat or pea stubbles, also very often after a crop of vetches eaten off by tying horses or carted to the stable, or gathered for seed; in the former cases there is time to make a partial fallow; also upon one ploughing up of a bean stubble, or after potatoes, or turnips eaten off, in the latter case spring wheat will succeed well to the end of March. The state of the soil, as to amelioration, must determine whether it be fit for the drill, or must be sown broad cast.

TIME OF SOWING.

"Wheat is sown as early after the 1st of October, as the rain falls to make it wet enough, but if not sown to Christmas, I have frequently seen good crops."—*Mr. Oldacre.*

"Wheat is sown from the middle of October to the end of November, under furrow, with harrows, and trod in with men, on the clover sward harrowed, and some little drilled."—*Mr. Darke.*

Mr. Richard Miller, upon Brant Hall farm, near Hales Owen, but in this county, sows his wheat about one half upon summer fallow, and the other half upon vetch fallow; $2\frac{1}{2}$ bushels per acre, or 3 bushels (if late sown) 9 gallons to the bushel, produce 20 to 30 bushels per acre: sort, the red lammas, of which a new variety, called Courland wheat, has been found to answer well.

Mr. Knight, Wolyerley, has this year, 1807, a 14-acre piece of wheat, sown on lay or turf once ploughed, which was manured only by folding sheep. The soil a light sand; 200 sheep were folded upon it from sowing time, the end of September, to the end of February, they went over 12 acres, 2 acres of the best land had no manure, the wheat was drilled in at 9 inches, $2\frac{1}{2}$ bushels per acre; by this experiment folding has not answered expectation, the crop being light but kindly, about 20 bushels per acre; wheat, the common lammas red straw.

Mr. C. thinks wheat should never be sown on very light soils except after turnips; autumn wheat may succeed those eaten off in time, and spring wheat may be sown with success to the end of March; this latter

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he thinks ought to be more attended to, and introduced, especially after wet autumns, which prove so unkindly to summer fallows; he has had as much grown per acre, succeeding turnips, as the winter corn; and a greater weight; the sort a little bearded. This kind he thinks cannot exhaust the land nearly so much as winter wheat, being not half so long on the land, and is ripe as early if sown in March, with the advantage of not being subject to mildew.—*Mr. C.* I remarked some spring wheat growing, which seemed to me a week or two later than the autumn wheat, but this *Mr. C.* observed was not sown till April, which is rather too late.

As a proof that wheat is very uncertain of succeeding upon over-tilled land, I give the following instance at one corner of the enclosed Lickey, near Bromsgrove, upon good light loam; observing in company with *Mr. C.* a crop extremely unkind, and overrun with weeds, the reapers picking it out, I enquired about the cropping and manure, and found as follows:—1st year, turnips; 2. barley; 3. wheat; 4. oats; and the crop hitherto good. The occupier was tempted to try wheat again on the oat stubble, but in order to give the land force; gave it a good dressing with bucking ashes from Bromsgrove (i. e.) linen whitener's ashes (which have been proved an excellent dressing for grass land) the wheat looked promising through the winter and till March; in the spring a prodigious shoot of the May weed, or corn chamomile (*anthemis arvensis*) took place, the wheat became totally enveloped and smothered in it, the straw mildewed, and the plant so far perished as not to produce the seed again. August 4, 1807, questioned the reapers concerning the cause of this failure of crop, they attributed it to the bucking ashes,

ashes; but reported the above as the preceding tillage. There can be no doubt but the failure was owing to the excessive tillage, in which the land had been fouled by the seeds of the above weed, whose growth was accelerated by the manure; I have known other instances of over-tilled land being rendered foul, so as to choke the crop by applying manure, which does more harm than good to any crop, unless the land can be kept clean from weeds.

Notwithstanding this failure, the average crop of wheat in Worcestershire may be put high. I estimate the common fields and light sandy land to produce 20 bushels per acre, the enclosed loams to average 4 quarters at least, or 32 bushels of 9 gallons each, which is the usual Worcestershire measure, and will weigh upon the average 70lbs. weight. In the Vale of Evesham in good enclosed land the blue cone wheat will often produce from 40 to 45 bushels per acre; the average of seed sown is two bushels and a half per acre; sometimes on strong land, and late in the season, three bushels per acre are sown.

The distempers to which wheat in this county is principally subject are, mildew and smut; of the former there is no great complaint this season: I saw it only in a few instances, and mostly in the parishes of Littleton. No attempt has ever been made at prevention or cure, or can be I suppose, other than good husbandry, keeping the land clean, and sowing in proper season a good sort of grain; the cause is, I believe, in the atmosphere, too much humidity and want of sunshine, the proximate causes, and improper tillage and an abundance of weeds the predisposing ones. With respect to minute fungi being the cause of this distemper, this is doubtless beginning at the wrong end; such,

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if they exist, being the effect of the distemper and not the cause, their natural growth being upon putrid or decaying substances.

Respecting the smut, the usual method of brining the seed is only one in use as a preventative. Mr. L of Kidderminster, who is, and has been very largely in practice both as a grower and manufacturer of wheat, informed me, that their usual method was to pour down the seed wheat in a heap, then flattening, or making a hollow in the top of the heap, to pour in brine, or urine, or both, till it was well saturated, and then drying it with quick lime in that state to sow it, when this was done the crop was uninjured by smut; when neglected their crop has been so smutty that they have not chused to use it in the manufacture of flour for bread; but have preferred selling it to the starch makers at an inferior price. It is well understood in this country, that no miller of character will buy wheat in any degree injured by smut, but at a very inferior price.

Mr. C. prefers a large tub of brine, or mixed with urine; it should be strong enough to swim an egg, and the wheat sifted or gently poured in, and whatever swims skimmed off, and then dried with lime, after drawing off the liquor to be used again as before; this he believes from experience and observation to be quite effectual in preventing the smut.

Observations.—This latter method is certainly preferable to the first; but if the liquor should get fouled by smut dust, it is unfit for further use; in the former case the liquor is used but once, and is far the best method, but the operation is imperfect; it has been proved by experiments made in Northamptonshire, and which I have reported to the Board, and which have been corroborated by experiments of my own, that

that brine is not essentially necessary ; but that if the seed-wheat be clean washed in any proper saline, alkaline, or acrimonious liquor, the smut is prevented. I believe clean common water would do ; but prefer a mixture of salt, or alkaline lye, to render it more active. It is certainly a great blessing to mankind, that a distemper in wheat so formidable as the smut, which renders it disgusting and nearly unfit for human food, should be effectually prevented by the simple operation of clean washing the seed, which I consider as an established point ; and that no one need be troubled with smutty wheat, who is not too idle or too negligent to perform that simple operation.

If wheat be ever so smutty, it is well known that clean washing, and careful drying on a kiln, will render it fit for use ; the loss is therefore the expense of those operations, added to the loss of the smutty grains, which contain only a stinking black powder.

With respect to black or burnt ears, they are, I suppose, known every where ; but the contamination is so slight, as not to attract much attention ; they are owing, I apprehend, to an imperfect impregnation, or abortion ; but never, in my observation, have they amounted to one hundredth part of the crop. Barley is equally subject to this complaint with wheat ; when it occurs to any extent, the produce should be rejected as seed ; as I have experienced, that the evil is inclined to increase.

With respect to the quantity of wheat grown in this, or in any other extensive district, it is difficult to estimate, with any certainty, without authentic documents, which can only be obtained by authority. I shall however risk an estimate, which those who are dissatisfied with it may correct ; after premising that Worcester-

tershire is in general by no means a hard tilled county; the hardest tillage is to be met with in the eastern district; the west and south being more inclined to pasture and fruit, or the hop culture.

Acreage.		Acres.	bu. per Acre.	Acreage.
20,000 ac. common field, $\frac{1}{2}$ th wheat		4,000	20	80,000
120,000—light land, sandy or gravelly, $\frac{1}{10}$ th wh.	12,000	20		240,000
220,000—friable, or clay loam, $\frac{1}{2}$ th wheat	27,500	32		880,000
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360,000 Total in wheat	43,500		1,200,000	
Deduct seed $2\frac{1}{2}$ bu. per acre			108,750	<hr/>
 Nett produce			1091,250	<hr/>

A Worcestershire bushel, upon which I have calculated, contains 9 gallons, and will weigh, on the average 70lb. this will produce 56lb. of flour, and will, in its turn, make 70lb. of bread. I reckon 5 bushel per head of 70lb. to be a good average allowance per annum for human kind; and therefore conclude, that this county produces wheat for bread for upwards of 200,000 persons. The population of the county is about 140,000: I therefore reckon, that, in a plentiful year, like the present, Worcestershire produces bread for 60,000 persons, over and above its own inhabitants; this surplus finds a ready conveyance to Birmingham, or by the Severn or canals coastwise, or to the populous parts of Shropshire or Staffordshire, either in its raw state, or ground into flour.

The stubbles of wheat are very commonly, and almost generally, mown in this county, raked together, and carried home for litter.

Rye, for a crop, is cultivated only in a small proportion; and the principal inducement to its culture, is the occasional

occasional demand for its seed to sow as early sheep pasture. I should suppose the growth of the sandy district of the county, as a crop did not exceed 1000 acres, in seasons of scarcity, occasioned by excessive rains; it is however a welcome addition to the resources for bread; its produce may be reckoned more than that of wheat, on light land, and may be from 3 to 4 quarters per acre.

No particular preparation is necessary, except a fallow manured upon very poor sand. In other cases, it may be sown upon a clean turf or stubble, be the land ever so light or sandy. Respecting its uses for bread in wet seasons, I am assured, by a gentleman of Kidderminster, whose knowledge and experience on the subject cannot be questioned, that in a grown or spouted (sprouted) state, it is not only unfit for bread, but an absolute poison, and that many lives have been lost by so eating it.

The principal and most valuable use of rye, is to form a very early sheep pasture for ewes and lambs in April; for this purpose, Mr. Carpenter says, turf land should be ploughed up in August, and sown about the end of that month with rye, 2 bushels per acre, and half a bushel of winter vetches to fill up the bottom; if deferred to September, it is too late to be worth the seed and loss of autumn grass; if thus sown in time, it will be half a yard high the beginning of April, and form an invaluable resource for ewes and lambs in that pinching time, and the land will be in good time to work thoroughly for turnips.

Barley, is generally sown after turnips on all land where turnips are grown; on strong clay loams, whether open field or enclosed, it is sown after summer fallow, and can be grown in no other system consistent with good

good farming ; though I believe a small proportion may be grown after pulse, or sometimes upon one ploughing of a clean turf.

When barley succeeds turnips, they should be, and generally are, eaten off in time to admit of two ploughings, the first immediately succeeding finishing the turnips, and the second immediately preceding the sowing of the barley, with proper harrowing between ; when this is the case, and the land in good heart, and well drained, it can scarcely fail being a good crop.

In enclosed land, clover and grass seeds are commonly sown with, or soon after, the barley. The sorts cultivated are generally the long ear, or sometimes the spratt barley (*Hordeum Zeocriton*), but I neither saw nor heard of the other varieties.

Drilling in of barley is practised both in open fields and enclosures, and the practice I understand to be increasing ; very good machines for that purpose are got up in the county, as well as imported from elsewhere ; seeds are sown afterwards, and harrowed in with light harrows, without disturbing the barley, though in some cases I could perceive a tendency to the grass seeds being in rows, which I believe is no inconvenience. Mr. Knight drills his barley at about 9 or 10 inches, 3 bushel per acre, no account made of saving seed by drilling ; the crops succeeding turnips are very good, 30 to 40 bushel per acre, which is a great produce for this light and sandy soil ; but the turnip fallows were manured for, and managed with, great spirit, and the season has been favourable, with plenty of rain at proper times, as well as sunshine. Mr. Knight observed to me, that he does not think he gains in produce by drilling ; but believes he should do as well by good broadcast sowing. Three rows only are

are drilled at a time by one horse, no hoeing used; seeds are immediately sown, red clover 8lb. white ditto 5 or 6lb. per acre, with sometimes a proportion of trefoil, and always a peck of ray grass. The seeds sown this year were in a stack, July 6, 1807, and were a good crop; barley ground is always rolled when the seeds are sown.

Folding for barley, upon a poor weak sand, for which there was no manure, and not being ready in time for turnips, the fallow was continued through the winter, and folded with sheep, and in the spring, 1807, sown with barley and seeds; the barley not equal to what might have been expected, not more than 20 bushels per acre, much inferior to that succeeding turnips; consequently, folding appears to be much inferior to spirited manuring and turnip-husbandry. But Mr. Knight means to make more experiments on folding, on account of the dearness of manure.

Respecting drill, and broadcast sowing of barley or other grain, Mr. C. thinks much more depends upon the land being kept in a clean and fertile state, than upon the manner of sowing; but the drill and hoe system will not always keep land clean without a good summer or turnip fallow; nor should the drill system be adopted till the land is well cleaned. Drilling of barley from 7 to 9 inches, has, however, found its way into the common fields, and into most parts of the county.

On strong loams, in the Vale of Evesham, the barley is sometimes ploughed in under furrow. After a summer fallow, the land may lay ploughed up during the winter frosts, and when it becomes sufficiently dry in March, it is harrowed down and the seed sown, and then ploughed in; if seeds are sown, they must be covered with light harrows.

With respect to the general produce of barley, in the common fields, from hard tillage, and on some moist loams from want of drainage, the average is not more than 20 bushels per acre of 9 gallons; but in the well-managed enclosures, and after turnips, much more. Mr. Richard Miller, on Brant Hall farm, a cool soil, reckons to grow from 30 to 35 bushels, and the best of Mr. Knight's cannot be less than 40 bushels per acre; and on some of the rich friable loam, 40 to 45 bushels is grown.

I estimate the produce of the county as follows:

ARABLE.	ACRES.
120,000 acres light land, $\frac{1}{3}$ th barley	15,000
120,000 — friable or mixed loam, $\frac{1}{3}$ th barley	12,000
120,000 — strong loam, $\frac{1}{3}$ the last proportion	6,000
	—
Total	33,000
	—

The average produce may be put at 4 quarters, or 32 bushels per acre, deduct seed 3 bushels, remains 29 bushels per acre; total amount 957,000 bushels.

Reckoning the consumption in malt liquor at 4 bushels per head, gives 560,000 bushels for the annual consumption of the county; the remainder, or near 50,000 quarters, is a surplus for other purposes, as the fatting of hogs or cattle, or for the consumption of the neighbouring populous country.

Oats are grown but in a smaller proportion, and sometimes sown upon one ploughing of grass land. Mr. Richard Miller generally grows thus, from 35 to 40 bushels per acre; and the oats are succeeded by potatoes or winter vetches; he sows 6 or 7 bushels per acre. Oats are sometimes grown upon new enclosed waste land, after paring and burning. I saw, upon a late enclosed

closed peat bog, but well drained, oats growing at least 50 bushels per acre.

Mr. C. thinks oats a very exhausting crop; but upon light land of inferior quality, believes may answer better than barley, but should succeed turnips, and be laid down with seeds.

He further complains of oats degenerating in quality; says, he has formerly had Poland oats 10 or 12lb. per bushel heavier than can be met with now; and thinks premiums should be offered to the merchants for importing seed-oats of superior quality.

The oats universally preferred here are the white oats, Dutch or Poland. A sort is known here, and has made its way in many parts of the kingdom, under the name of Potatoe-oats, the name said to be derived from having originally come over in a cargo of potatoes; it is a good white oat, bolder and larger than the common Dutch oat. The culture of oats in this county is not, I believe, greater than for its own consumption, being seldom grown upon the rich or fertile lands, the average produce may be reckoned 36 bushels per acre, and the seed sown 6 bushels.

Pease are cultivated in the fields, but upon a small scale; nor does the crop in general seem to answer here so well as grain or other pulse. In the present year, 1807, there has been an almost total failure, a ten-acre piece, harvested near Evesham, was shewn me by the owner, which he estimated would not produce him more than 6 bushels per acre; the stubble was working as a partial fallow for wheat, the crop had been drilled, but owing to sudden rain had been prevented hoeing, and became smothered with weeds; other pea-crops had been cut as fodder for horses; but

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I was informed some good pea-crops had been harvested at Fladbury the last week in July, 1807.

Peas are grown either upon one ploughing of turf, or upon a barley stubble; ploughed up after fallow barley, and are generally succeeded by wheat; they are sown broadcast, or drilled, and seldom set by hand; produce precarious; a good crop 30 to 40 bushels per acre, a great yielding crop sometimes more, and often times less, down to 20 bushels per acre, or to scare the seed again. This crop should certainly never be sown but in rows, on clean land, and kept perfectly clean from weeds by hoeing.

Beans are grown considerably upon the strong lands of Worcestershire, and none but the greatest slovens now think of sowing them broadcast; they are very generally either set by hand, or drilled by a machine; in the former case women and children are principally employed, who set from 3 to 4 bushels per acre, at from 1s. 6d. to 2s. per bushel (of 9 gallons) with the allowance of a quart of cyder per day each; the average expense of thus setting may be reckoned at about 8d. per acre; the time of setting is February and March. Mr. Darke observed, "we excel in nothing so much as setting beans, it is superior to drilling in its most perfect state; they are all set by line, and we prefer setting them north and south, to have the benefit of the Sun betwixt the rows; they are hoed three times with the gardener's coming-hoe; the large tick bean is used, and they produce sufficient to satisfy the cultivator."

The machines for drilling beans, lay in two rows only, and are drawn by one horse, at about 18 inches distant, with a holder and driver; 2 acres per day may

be

be drilled ; the expense may therefore be reckoned less than one half that of setting.

August 6, 1807, I examined a bean field adjoining Hampton Church-yard, near Evesham, set in rows 18 inches asunder, 4 to 5 feet high, and well podded ; the crop cannot be less than 40 bushels per acre : saw many other fields of beans set or drilled, the crops generally good, free from mildew or insects. Mr. Murrall, of Evesham, shewed me a field of his drilled by a machine at 14 inches, the crop clean and good, full 4 quarters per acre. A good crop of beans will sometimes produce 40 to 45 bushels per acre.

The harvesting of beans is in August and September ; they are cut by hand with a hook, and laid down in armfuls to season and dry ; they are afterwards gathered up, and set an end in shocks ; and, when sufficiently seasoned, are carried to the stack. I suppose the growth of beans in this county to be considerably more than its own consumption.

Vetches. Winter vetches are sown the latter end of September, and summer vetches in March, April, and May, for succession ; but I have always had the best crops from winter vetches.—*Mr. Oldacre.* I have seen them up this season, 1805, in September and October, and some sown in drills ; they are principally eaten green by horses, either by tying to them, or carrying them to the stable, and a proportion are saved for seed.—*W. P.*

Vetches are very generally cultivated in Worcester-shire in most parts of the county, and the main object is for feeding horses in their green state ; they are seldom never made into hay, the excellent natural meadows of the county rendering that unnecessary.

Mr. Richard Miller, Brant Hall, always grows 6 or 8 acres,

8 acres, part autumn and part spring sown; they are mostly carted to the stable.

At Mr. Knight's, Lea Castle, Wolverley, vetches are regularly cultivated, and always with a view of carting to the stables; the present year, 1807, I there examined a piece of 10 acres; drill sown, mostly in the autumn, but part in the spring, the crop good; two single-horse carts can at once draw enough for a night and a day's consumption of twelve horses; which, in July, the steward and I estimated to consume half an acre per week, at which rate 10 acres last twelve horses twenty weeks; they were drilled at nine months and hoed, and will be followed by vetches again; but Mr. Partridge, the steward, thinks, on their light land they are in general best followed by a fallow for turnips.

I observed, about the middle of August, part of these vetches were cut for a crop of seed, they having run too ripe to be used as green food.

Upon this subject of making vetches last the greatest length of time possible as green food, Mr. C. observes, that the winter vetch early mown, that is at any time before being in full blossom, will, in its second shoot, or aftermath, continue green much longer than the spring sown vetch; but after being in full blossom, the aftermath is not worth saving. The true system for extending their use is probably this, 1. manure, and sow early in September, to be ready for cutting the beginning of May; 2. continue sowing in September for succession, and a few may be sown in spring for comparative experiment; 3. the second shoot of all those cut before the plant is in full blossom must be preserved for late use; but, when the full blossom is attained, the ground may be ploughed as the crop is cleared. Mr. C. thinks, that by judicious management upon

upon this system, vetches as green food may be secured generally through the months of May, June, July, and August.

Mr. C. further says, upon an arable enclosed farm, one-tenth of the arable is not too much to be sown with winter vetches, in a dry summer all will be wanted, or cut in full blossom ; they make excellent fodder, or may be saved for seed ; in general, they do best sown about the end of September for general use.

He also says, horses are best fed with vetches in the stable, as they are then always in readiness for work, besides making a deal of manure ; some, however, think tying the best, especially for young horses. Cattle, sheep, and pigs, are equally fond of vetches ; in some years, when grass has run short for milking cows, I have cut vetches for them, and thereby kept them up to their milk, till rain came to bring forth the grass, otherwise the cows would have been nearly dry.

In order to be sure of the true winter vetch, it is best for the farmer to save his own seed ; the winter vetch is known by its growing bushy for some time after springing up ; the other sort growing spiry, and will not stand a hard winter ; seedsmen are sometimes deceived themselves, and the value of the seed has been known to be returned when the crop has perished by frost ; but this does not make amends for the lost crop.

—*Mr. C.*

I shall beg leave to conclude the subject of vetches, by an attempt to correct an error very prevalent, which is that of calling vetches tares ; vetches are no more tares, than wheat is rye or barley, being of a distinct and different genera and species, though of the same class and order, but having distinct essential characters. The vicia, or vetch tribe, includes the plant in question

(vicia

(*vicia sativa*,) and with it five or six more species, which are natives; also the different varieties of beans and pease, which are but different families of the same tribe, and though originally exotics, are now naturalized. The ervum, or tare tribe, includes two native species, the smooth podded and rough podded, both terrible weeds when abundant in corn; the seeds are generally four in a pod, but sometimes more, the lentil (*ervum lens*) is of this genus.

Potatoes. This excellent vegetable seems to be entirely got clear of the curl, no appearance of it to be seen in the crop, nor complaints heard of it in conversation; the cure of the disorder has been radically effected by rejecting the old sorts, worn out or degenerated, enfeebled or debilitated, (according to Dr. Darwin) by repetition of solitary reproduction from sets or cuttings, but now restored and renovated by the introduction of invigorated varieties, raised by sexual reproduction from the flowers and seed vessels; the time of planting potatoes is March, April, May, and some in June.

Potatoes are grown in great plenty and perfection in this county, and in a variety of ways, both by hand work, and the plough. In the neighbourhood of Bromsgrove and elsewhere, are large field plots, well-managed and kept clean; and the present year, 1807, nothing can be more promising for a crop.

Mr. Richard Miller, upon Brant Hall Farm, prefers the following method: after well working and manuring the land, it being harrowed down level, to strike furrows with a common plough about two feet asunder, then to drop in the sets by hand, and cover them slightly with a hoe or rake, and as they shoot, horse-hoe them with a plough, turning a furrow either way,

way, the earth boards on either sides of this plough can beset wider or narrower by screws ; it is also adapted for hoeing cabbages, or any other crop in rows, at a proper distance ; he reckons to grow from 300 to 400 bushels per acre, of 80lb. to the bushel ; and has grown annually about four acres ; sold them, in 1806, at 20l. per acre growing ; the buyer getting them up, but he drawing them to Birmingham, about six miles distance.

Mr. Carpenter says, potatoes were known in England a little before the year 1600 ; they succeed on any soil, but best, both in quantity and quality upon light land ; he prefers growing them after turnips, as they want no other manure, and it ensures a clean crop. The mode he adopts is to give the land a first ploughing and harrowing, and then to plough the whole field in two furrow ridges, the furrows of a moderate breadth ; women and children then drop the seed in each opening at six inches a part ; this done, draw, with one horse, a light pair of harrows across the furrows to cover the sets ; the land being in a clean fertile state requires hoeing or moulding but once ; and at gathering the crop, there being no weeds, prevents much trouble and expense.

In addition to these methods, large quantities of potatoes are set by hand in holes made by a dibble or setting stick, both after digging and the plough. Mr. C. relates a case of two day labourers, who, in his neighbourhood, in the spring of the year 1800, gave a guinea for an acre of waste land to plant with potatoes ; they pared and burnt it by moonlight after their daily labour, spread the ashes, and paid for ploughing them in ; the crop proved so good, and the price of potatoes so high, that they shared 40l. between them, besides reserving plenty of potatoes for their families.

USES OF POTATOES.

In times of scarcity their value is well known as human food, when cheap they are of great use to pigs and cattle; to make pigs fat they should be boiled and mixed with about one-third part of ground barley, rye, or other meal; store pigs that go about thrive well with potatoes in a raw state; and, by giving a feed of raw potatoes once a day to fatting pigs, they require less water, and by thus changing their food they will thrive better than by confining them to one sort of food only.

Potatoes when boiled are good food for all kind of fowls in a lean state, and will make them fat with speed, mixed with a third or fourth part of barley-meal, which is also good food for dogs, and further improved by a little oatmeal, skim-milk, or butter-milk.—

Mr. Carpenter.

Respecting the sorts planted, the names are merely provincial, and would, therefore, convey no general idea. A great variety of early and late sorts have been raised, and their qualities are well known to every cottager who has a garden; the sorts called here blue kidney, and Prussian white, were named to me by Mr. C. as famed for excellent cropping.

The quantity of potatoes raised in this county is very considerable, not only sufficient for their own consumption for man and beast, but large quantities are sent to the market of Birmingham, and to the populous parts of Staffordshire.

Turnips are pretty much grown in this county, and in various rotations; on friable loamy soils, very often after the ploughing up of a wheat, or other stubble, in autumn; cross ploughing and harrowing down the same

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In March, a third ploughing and harrowing down in May; then manuring with dung, or lime, or both; ploughing up and sowing the end of June or beginning of July, and two hoeings afterwards; this management gives a good chance for a crop, and tends to cleaning the land, and preparing for the succeeding crop of barley.

The crops of turnips are in general very good on those lands that suit the cultivation; we have lately practised hoeing, and find it adds one-third at least to the value of the crop; we eat the greatest part off with sheep, though many are handed into the farm yards for cattle; in wet seasons our sheep tread the lands, owing to the deep loam and loose soil, to the prejudice of our barley crop; notwithstanding which, we prefer the sheep for this business, as it firms the land, and backens the mathorn poppies and other light weeds, and prevents them from getting too powerful in the succeeding crops.—*Mr. Darke.*

Mr. Richard Miller, Brant Hall, being short of turnip land, sometimes grows turnips on the same land four or five years together, and with the best success. Swedes succeed best after the common turnip, and snucked from Birmingham at six miles distant; he grows about as many Swedish as common turnips, and often the two sorts in rotation; the first turnips generally succeed wheat.

Mr. Knight grows annually fifty acres, or more, generally upon a turf fallow, but sometimes after wheat, vetches, or carrots; they are mostly drilled, but some sown broadcast; the turnip drilling is thus managed, after well working the land and laying on lime four tons per acre, which costs 14s. 6d. per ton, ready money, delivered upon a canal against one side of the farm, the lime being spread and well harrowed in, the land

land is stricken into two furrow ridges, about two feet from middle to middle; the dung cart is then applied, and a row of rotten dung laid along every fifth hollow, at the rate of about ten tons per acre; this is immediately divided and distributed along the hollows, and another plough follows to cover the dung, by dividing the ridges upon it in single furrows; the drill machine follows, drawn by one horse, going along one of the hollows; a roller presses down two ridges, one on each side the horse's path, in which the seeds are deposited over the manure, and covered in by short rollers; following the delivery, two rows only are thus drilled at a time, by one horse, upon four furrows. Mr. Partridge, the steward, observes, they get on thus at the rate of one acre and a half per day, with nine or ten horses, four in two teams to plough, one at the drill, and the rest at the dung carts; the whole is immediately done on the fresh soil, by which the vegetation of the seed is promoted, the dung covered up under the seed, and a good crop generally ensured. But Mr. P. thinks the distance in the rows being about two feet is too wide, as they are horse and plough hoed; and that more weight per acre might be obtained by broadcast sowing, which is sometimes practised, particularly on uneven land, where the drill does not work so well.

When dung is not used in addition to the lime, soot is substituted, 50 bushels per acre, at 8d. per bushel, besides carriage; but the soot merchant sowing it upon the land well worked and harrowed down; the land is then stricken into ridges as before, and the drill immediately follows without turning back the furrows; the cleaning is performed by a hoe-plough between the rows, which are afterwards further thinned by women

and children, no skill being necessary; about 2lb. of seed is drilled to an acre.

In some other places, I saw turnips drilled on level land, at about 9 inches, but the greater part of this crop is, at present, sown broadcast.

Mr. C. has made comparative experiments on the effects of muck and lime, and both on turnips and the succeeding crops, and reports as follows:—

No. 1. Muck and lime, both for turnips; turnips, barley, and seeds good.

No. 2. Muck only for ditto; turnips rather inferior, barley better, seeds good.

No. 3. Lime only for ditto; turnips inferior, barley three-fourths the former, seeds better than either, and after three years pasture, the land equal.

Mr. C. reports a piece of land in his occupation, sown with turnips, being so full of chadlock, that no hoeing, or weeding, could master it the first year; it was, therefore, fallowed for turnips a second time the ensuing year; the chadlock came up very thick after the first and second ploughings and harrowings; but, after another ploughing, became clean, and has continued so ever since.

Mr. C. thinks turnips upon light land, should always be sown upon a clean turf fallow, or after rye and vetches sown in August, and eaten off by ewes and lambs the April following; in this rotation they scarcely ever fail, will do with less manure, and the land will produce more grain afterwards by many bushels per acre, either of wheat or barley, than when it has been previously exhausted by cropping from the turf. He prefers, for early sowing, the tankard turnip, the white Norfolk, and the bell; or some of each sort; for the second sowing the stone, and for the last the early Dutch.

But whatever sorts you sow, he says, "it is necessary to plant turnips for seed under your own inspection; the proper time is November, and to prefer those turnips that are best in shape, clearest on the rind, with the fewest wrinkles on the crown, and before planting the top should be cropped; as I have known a wild sort come from the seedsmen, that has run in the top, and produced very little bottom."

Turnips are sown here from midsummer to the end of July; hoeing is done at 5s. per acre the first time, and 2s. 6d. the second, with a gallon per day of beer to each workman. Many things have been suggested (says Mr. C.) to preserve turnips from the fly, but there is no dependance to be placed on any of them; night rolling does not answer the end, the only precaution is to give the land a fine tilt, and fill it with manure to push the young plants into the rough leaf, at which time they are safe; but this will not prevent the ravages of the fly, if attacked by them before that period. To this I shall add, that sowing every day immediately after the plough should never be neglected. I scarcely ever knew a piece of turnips much injured by the fly, where this practice had been rigidly adhered to.

Mr. C. professes to be in possession of a nostrum, or specific, that will effectually answer the end; and will drive the flies out of a field of turnips, if they appear ever so numerous, will secure the crop, and do material service to the young plants in their future growth. This secret I requested him to detail in this Report, and trust to the gratitude of his country for a suitable recompence, but this he has hitherto declined; he offered to communicate it to me, if I would keep it secret, but this I refused, telling him whatever information I received I should communicate.

He

He advises to sow half a gallon of seed per acre, instead of the usual quantity of from 1 to 2lb.; when the plants appear to harrow the piece with light harrows lengthwise, and a few days after harrow crosswise, the fly, he says, will be much disturbed by the harrow, the plants thinned, and the operation of hoeing facilitated. Respecting the best method of using turnips to advantage, he thinks, if the land be in high condition, a considerable part of the crop may be drawn off to stalls, or turf land, for cattle, or sheep; but if the land be indifferent or poor, the greatest part should be consumed by sheep, on the place of growth. Turnips are often sown on early stubbles near Kidderminster and elsewhere, on sandy land, for spring sheep pasture; and, to be succeeded by turnip fallow. A very good crop, 1807, there, sown after barley, harvested August 9.

Mr. Carpenter has since communicated to me his preventative, or preservative, against the fly in turnips, which he permits me to make public, together with a certificate from a gentleman who has proved it. He intends to publish a second edition of his Treatise on Agriculture; but, supposing this Survey may come before the public sooner than that makes its appearance, he permits me first to report it. If the effect should be properly established by experiment, he will certainly be entitled to the consideration of his country, and to a remuneration proportioned to the importance of the discovery. He believes it will never fail, if strictly adhered to.

The turnip fly, that he refers to, appears to me, from his description, to be of the beetle kind, (*chrysomela nemorum*;) wings two, covered by two shells, skipper, hop or take wing, length half a line (*Berkenhout*).

kenhout). A line is, I believe, one-tenth of an inch. This insect, when much disturbed, takes wing, and is soon out of sight.

As prevention is better than cure, the first process is in the preparation of the seed; mix an ounce of flower of brimstone to every pound weight of turnip seed, at least twenty-four hours before sowing; sow two quarts to an acre regularly and well, and so as to cover the ground well without vacancies, then look over the ground once or twice a day for the fly, if with a microscope the better; if the fly be discovered, immediately harrow; if not, harrow to thin the crop; and cross harrow till thin enough for hoeing; if the fly comes or continues, then sow 8 bushels per acre of dry lime, or dry sifted fine ashes; but, at all events, hoe in time, and repeat it, if necessary; the sowing of lime, or ashes, should be done early in the morning, or in the evening when the dew is on, as it then better adheres to the leaves of the young turnip plants.

Mr. C. has great confidence, that if these rules be strictly attended to, the effects of the fly on turnips will be prevented; but says, "if people will not be at the trouble, they must take their chance. He has never known it to fail, and the communication was attended by the following certificate.

Impney, July 16, 1803.

" This is to certify, that I have, with satisfaction,
" tried the method recommended by Mr. Car-
" penter, for preventing the ravages of the
" flies on turnips, and have found it effectual.

" RICHARD FRANCIS."

To the above, I would add a recommendation, that turnips in dry weather, should be always sown on fresh ploughed

ploughed land, the same day the land is ploughed. I hope gentlemen and farmers will try Mr. C.'s method upon part of their turnip ground, by which, and comparing that part with the other, its merit, or inefficacy, may be ascertained and determined.

Further Memorandums on Turnips, Common and Swedish.

Mr. Knight's steward, who manages another farm, where he cultivates turnips broadcast, thinks ~~he~~ beats Mr. Knight's drilled crop; the latter has challenged him to weigh, which he has hitherto declined.

Mr. Knight informed me that his Swedish turnips, were this year, 1807, manured for with muck, the crop preceding having been common turnips; that part of the seed had been procured from Sweden, he having connections there in the iron trade; but, neither he nor I could perceive any advantage either way in the crop, between foreign and English seed.

Memorandum, Oct. 1807.—Turnips which escaped the mildew common on them this season, now grow fast; the Swedish have been less affected, and are thriving and good.

I more than once called at Mr. Knight's, at a time fixed to have weighed a perch of turnips, drill and broadcast, and thus to have ascertained the weight of each per acre; but the weather was so unfavourable each time that it was obliged to be given up; but I know, from experiments of my own, that it requires a very good crop to be twenty tons per acre, that half the quantity is much oftener grown, and that a good average crop is not more than fourteen or fifteen tons per acre.

Swedish Turnips are grown in this county, but not considerably;

considerably ; the few I saw were sown broadcast, March 30, 1807, viewed Mr. Richard Miller's crop, Brant Hall, about four acres, and very good, now eating by ewes and lambs, they succeeded common turnips, and were mucked for from Birmingham ; he saves his own seed by transplanting the best formed roots into a garden bed ; seed sown from two to three pounds per acre, and perfectly cleaned from weeds by hoeing ; he has grown them for many years, and means to continue their growth ; they are generally followed by common turnips.

At Mr. Knight's, about five acres had been sown broadcast, the last week in May, 1807 ; they were in July of promising appearance, and had been well hoed and cleaned ; they were sown after common turnips the year before. I went over this field again with Mr. Knight, September 29, 1807, and found the crop very full and good.

In my tours through the county, in 1804, I saw several specimens of Swedish turnips upon a small scale, and even in the common field of Bredon. Mr. C. reports, that they have been given with success to horses in the spring seed-time, being first washed, and given morning and evening ; half the usual quantity of corn was sufficient, the horses refused good clover when they had Swedish turnips ; the man who looked after them, says, they are equal to carrots for horses, and he has proved both ; the horses refused the common turnip, if any happened to be mixed with the Swedish ; they are proper to give horses from Christmas to May.—*Mr. C.*

Cabbages are known in field culture, but not to a large extent ; I sometimes met with them in hop-yards, in a row with the hop-plants, where they grow well, and

and to a large size. Mr. Richard Miller is a grower of cabbages to the extent of about two acres; the spot of ground he has fixed upon, is a peat bog, which happened to be near the farm-house; this being well drained, was first planted with potatoes, and sown with cabbages annually, on the same spot, but mucked at times from Birmingham; he saves his own seed, and sometimes furnishes his friends and neighbours. The sort he grows has a purple cast between the drum head Scotch and the red cabbage, he has planted these two sorts together for seed, and is sure they have intermixed; they are hard and firm, and stand the winter better than most others.

He sows the seed in his garden at two seasons, August, and early in the spring; the spring sown plants much the best crop, March, 1807; the autumn sown having got too forward in November and December, 1806, owing to the warm and growing weather at that time; in consequence of which, the leaves fell in winter, they are carted to turf land, or stalls for sheep, and all kinds of cattle stock.

Carrots.—Wolverley sands have long been famous for the growth of carrots, as well as for saving carrot seed. Mr. Knight has, this year, 1807, a piece of about ten acres, and means annually to grow about the same quantity; they were sown in March upon turf, or ley ground, of two years standing, trench-ploughed to about twelve inches deep; after ploughing and harrowing, the sowing is thus conducted: a hand drill is drawn by a man, making three small drills, twelve inches asunder, (see IMPLEMENTS); two women follow and sow the seed by hand in two of the drills, the seed being previously rubbed and mixed with sand; on the return the vacant drill is occupied by one of the fangs

fangs of the machine, thus gaging the distance, and so in succession till the whole is completed ; the seed is covered in by hand raking. Considerable attention is necessary in the sowing, otherwise there will be vacant places ; the hoeing and cleaning is performed by hand, at about a guinea-and-a-half per acre ; turnips generally follow this crop ; they are given to horses, or other live stock occasionally, or otherwise sold to the market people, wholesale at 2s 6d. per hundred weight, who fetch them away, and carry them to Birmingham, Stourbridge, or the populous parts of Staffordshire. A good average crop will produce fifteen tons per acre, which, as above, amounts per acre to 87l. 10s. the soil is a deep sandy loam ; about four pounds of seed is sown to an acre.

Mr. Knight has sometimes sown carrots after turnips, and thinks they succeed better than on turf land trench-ploughed ; but his steward observed to me, that upon pulverized land, though apparently clean, being of slow growth from the seed, they are so apt to be choked by weeds, especially in wet seasons, and so difficult to keep clean, that he prefers turf land trench-ploughed ; in either case the land should be as clean as possible, and the richer the better ; some of his neighbours sow a few acres, generally broadcast mixed with sand ; the seed has been mixed and sown with brewer's grains, to sprout it before sowing, and occasion a quick growth, and this method is supposed to answer. Mr. Honeybourn, at Dishley, Leicestershire, assured me, that he had perfectly succeeded in sowing carrot seed by Cooke's drill, being first well rubbed, and intimately mixed with saw-dust sifted, the ladles of the drill will then take up and regularly deliver it ; and he desired me to recommend this to Mr. Knight,

and

and the Wolverley carrot growers, as a means of saving them a great deal of trouble in the sowing of that difficult sowing seed.

I was assured that the growth of carrots had begun to decline amongst the Wolverley farmers, till Mr. Knight took it up with spirit and roused their attention. Respecting their application, nothing is known of making the tops into hay, but any kind of stock will eat them green; and Mr. Knight thinks them worth 20s. per acre, besides labour, to cut off and carry green to sheep, throwing them upon pasture land, as he has found by experience that sheep are fond of them, and he believes them to be wholesome food as well as nutritious; they are equally acceptable to hogs. Respecting the roots, any kind of stock will take to eat them greedily, and in such quantity as not to pay for the food, when there is a demand for it at market; but thinks them hardly food good enough for his horses, which are in constant work and exercise, unless mixed with some more astringent food; and believes that for that purpose they are inferior to corn and hay; he, therefore, prefers selling them to the market people, when they will fetch them away, at 2s. 6d. per hundred weight.

Storing.—Various ways have been tried, as burying in dry sand, but this is troublesome except for small quantities; storing within the building, and also burrying in tumps or heaps in the manner of potatoes; and in all which ways they will sometimes keep well; but are, at other times, liable, when put together in too large quantities, to heat from fermentation, in which case they will rot with great rapidity; the same misfortune has been known to happen to potatoes,

but

but carrots are still more liable to it, though they are much more hardy with respect to frost.

Mr. Knight, from attentive observation, believes the best way is to let them remain in the ground, and fork them up as they are wanted; they are little liable to injury from frost, especially on dry sandy land, and will remain good till the tops begin to shoot in the spring.

A good deal of carrot seed is saved at Wolverley, and sometimes has been sold to London. I remember an anecdote told me, some years ago, of a Worcester-shire gentleman, who, thinking to get better carrot seed, sent for it to London; but, upon inquiry, found it had been grown at Wolverley, in his own neighbourhood, Mr. Knight generally procures the seed from London, not having yet grown any, and having been refused seed by one of his neighbours from jealousy; he believes the London seed to be equally good.

The process of growing carrot seed, is similar to that for the seed of turnips; select out some of the kindest plants, root and branch, trim the tops of straggling leaves, and plant them out at a proper distance, they will shoot in the spring, and nothing more is necessary than to keep them clean from weeds and free from vermin, till the seed is ripe, when it may be cut and rubbed out.

Clover is considerably cultivated in this county, both for pasture, fodder, and seed; Worcester being a great market for dealers in seed clover, where many speculative bargains are made; besides, with the farmers who buy it for use, it is generally sown with barley, sometimes amongst autumn wheat in the spring, and sometimes with spring wheat, more rarely with oats.

oats or other crop; the quantity sown depends upon the mixture with other seeds, and varies from six or eight, to twelve or fourteen pounds per acre; it is generally sown in April.

Clover is often succeeded by wheat, in which case, the best system is to mow the clover for hay in July, and let it run to a strong aftermath; then stock well, and graze it down about Michaelmas, spread the dung left by the grazing stock, and plough and sow directly; this, I think kindlier for the wheat than grazing the clover the whole of the summer, but it is done in all ways; sometimes the aftermath is mown a second time for seed, and afterwards sown with wheat; this must be very exhausting, unless the land be dunged for the wheat. If clover be saved for seed, the land ought to be spring grazed to the beginning of June, then dressed over, hayed up, and saved till the seed is ripe; after which, if in good heart, it may be ploughed and sown with wheat, but must be turnip fallowed and manured after the wheat, otherwise any land will be exhausted.

White clover is sown here mixed with other seeds, in laying land down with barley, for pasture, the common allowance four to six pounds per acre; but I am assured more still is better for the future pasture. Mr. Richard Miller sows eight pounds per acre.

Respecting land tiring of clover, the opinion of the best and most spirited cultivators is, that the land will not tire of clover so long as it is well managed, and kept in good heart; if it be worn out and exhausted, it will not have strength, or power, to force a good crop of clover or any thing. Mr. Knight has no fear of the land tiring of clover if well manured; and Mr. C. says, the complaint of the land being tired

of

of red clover, is caused by repeatedly sowing this seed in the same field, without any improved culture; if land were laid down with the first crop after a turf fallow, and plenty of lime used, which proves so salutary in promoting the growth of seeds, no such complaint would exist.—See SEED CLOVER, and CHAR. VIII.—Laying Land to Grass.

Trefoil is in less repute than the clovers, though it is sometimes mixed with other seeds (being generally cheaper) and sown about four pounds per acre, to fill up vacancies, where it makes a good and sweet pasture; after mowing, it cuts no figure in the aftermath, and the sort generally sown (*medicago lupulina*) is an annual plant, and if it continues in the ground must be reproduced from shedding its own seeds.

Ray Grass is sown with the other seeds at laying land to grass with barley, from a peck to a bushel per acre; its great use is for early spring pasture, being generally a fortnight before any other grass; many farmers, upon good loams, have rejected it at times, till, finding their error by the lateness of their spring pastures, they have been glad to take it in again; and it is now in general good repute; on good rich loams a peck an acre is thought enough; Mr. Knight, on his deep sandy loam, sows two pecks; and Mr. Richard Miller, on cold high loam, sows one bushel per acre; it is supposed to last as long as the land lays ~~at~~ grass, and when ploughed up, is succeeded by ~~other crops~~ follow in the usual course of tillage.

Sainfoin and *Lucern* are not at all, I believe, grown in this county, at least I met with no instances, nor heard of any. Mr. C. has strongly recommended the growth of sainfoin, but clearly not experimentally, as he has not pointed out the proper soil, which should be

be a dry and not cool surface, upon a loose, open, understratum, stony, or otherwise; upon thin soil, with a hard, gravelly, or congealed understratum, it will not do at all; as for the plant to flourish, the root must have room to strike deep; its appropriate place of growth, is chalky or calcareous high ground, upon a loose, open, stony bottom, where clovers would not well succeed.

With respect to lucern, he very properly observes, that since the culture and use of winter vetches is so well known, lucern is less necessary; but it being a hardy perennial, capable of lasting many years, is well worthy of trial against vetches, which must be sown annually at a great expense in seed and labour; I believe that lucern, for eight or ten years, would annually be equally productive with vetches for one year, and that it is equally nutritive; it will succeed on clean land either drilled in rows and kept clean till it is got a-head, or will do transplanted; but, I believe, will not succeed broadcast; with Cooke's drill it may be laid in between rows of barley; there would be no doubt of it doing well, and succeeding upon the rich loams of this county, if it had only a fair chance in culture.

Chicory, (*chichorium intybus*), unknown in cultivation in this county, though plentiful as a native plant, but unnoticed by the farmers, except as a weed; I found it, 1804, plentifully at Pinnin, north of Pershore, upon the headlands of several enclosures; and again, 1807, in many parts of the Vale of Evesham, growing luxuriantly; it is always browsed on by cattle in the spring months, if within their reach, but towards July runs up stalky and weed-like: recommended by the Secretary to the Board for Cultivation, for feeding of cattle;

cattle; I named this circumstance to a farmer, (Mr. Murray, of Evesham,) and pointed out the plant to him, growing in company with melilot, by the roadside near Evesham, at the ninety-six mile-stone from London, and five from Pershore.

Burnet, (*poterium sanguisorba*), also unknown in cultivation, though a native; I found it, in 1804, high on Bredon Hill; on very barren waste land near Church-lench; on rich red loam near Inkborough; and in a meadow near Tenbury; and, in 1807, in the church-yard of Hampton, one mile from Evesham; on the north side of the church; this is the upland burnet, a very different plant to the meadow burnet (*sanguisorba officinalis*) has been cultivated, and is worthy of it, on high, dry, and calcareous soils; it is cultivated as a salad in the gardens near London.

Buck Wheat is but little cultivated; I saw it in a single instance of two or three acres, a few miles north of Evesham, in a miscellaneous field of buck wheat, turnips, cabbages, and potatoes, September 6, 1806; the buck wheat, a full crop, just mown, and laying in the swathe; also, in 1807, saw a whole field near Westwood, the seat of the Packington family, this last on poor land; the principal use of buck wheat is to feed game and poultry, it is also good for swine, and in some places is manufactured into thin cakes, called crumpits, which are a delicacy of the tea-table.

Hemp and *Flax* are not very common, but are sometimes grown; the hemp in small patches or yards, which, to produce a full crop, must be clean from weeds, in fine tilth, and in good condition; it is sown the beginning of May. *Flax* is more commonly grown; I saw a good deal of it near Bromsgrove in barns, and the seed punning out; and a whole field covered

covered with flax near Pershore, laid out for what is called watering, that is rotting the stalk, to make it part with the bark or filament. Mr. Pomeroy says, hemp and flax are grown, but chiefly on small tracts, occupied by little proprietors, a general opinion prevailing (though unjustly) that they impoverish the soil; and he gives an instance of great fertility and amelioration by introducing flax between crops of grain; it may be observed, that the land in this case must have been of a good staple, and the hemp and flax must, in some degree, rob the land, as they support no live stock, and make but little manure, and that of a meagre quality. Mr. C. who has been a considerable grower of flax, says, it will come to perfection on most soils, but, in general, it does best on light soils; he says, it takes very little root in the ground, and, on that account, can be no great impoverisher; when sown in good time, in an early season, in March, or the beginning of April, commonly proves an early harvest, if the land be in good condition; he has grown turnips after flax, by being expeditious in ploughing and sowing, worth more than the rent of the land; care must be taken that the seed be properly ripe when pulled, it being a valuable part of the crop.

The chaff of flax is superior to that produced from grain of any kind, being excellent food for horses, mixed with oats or beans; the oil and cake from its seed are well known as valuable articles, and the manure made from cattle feeding on the cake is superior to that from any other food.

The tithe of flax (Mr. C. says) is fixed at five shillings per acre, and parliament, to encourage its growth, have ordered a bounty to the grower of four-pence per stone, which, in a middling crop, amounts to ten shillings

shillings per acre, and in a full crop to considerably more.

But in the growth of this valuable plant, the law of the land, and the custom of landlords, are at variance; the former offers bounties for growing it, and the latter generally forbidding its growth, although such growth may often be profitable to the grower, and for the public good, without injuring the land; for, if the land be fallowed for wheat or turnips, as is most proper, it will be in better condition than it was before.—*Mr. C.* He recommends sowing the best Riga flax seed, as producing the best quality both of stem, skin, and seed, and will so continue for two or three years, and though dearest at first, is cheapest in the end.

Mr. C. recommends, after flax, stubble turnips, and the second year turnip fallow; he says, two bushels and a half is a proper quantity of seed for an acre; the land should be well harrowed previous to sowing the seed, as well as rolled, as it cannot be in too ~~me-~~ liorated a state at sowing; the bounty, he says, is an object, having received 60l. at one time, for flax and hemp, by order of the sessions at Worcester.

The various processes upon hemp and flax, after leaving the land, can only be described by those who are intimately acquainted with them, from whom it is not easy to get accurate information. When they are ripe and harvested, agriculture has done its part; the rest may be considered as a branch of manufacture.*

Hops.—This plant has been long cultivated in this county in great perfection; but, as Mr. Pomeroy has gone, at considerable length, into their culture, and

* Vide Premiums of the Board for 1809, for encouraging the Growth of Hemp.

with great accuracy, I shall beg leave to insert his whole account, after making a few short remarks from my own observations, according to the plan prescribed by the Board.

The hop-grounds I more particularly examined, were those of Messrs. Crane, at Lower Areley, in the Vale of Severn, and those of —— Smith, esq. Mr. Wheeler, and others, in the parish of Lyndridge, in the valley of the Teame; the soil of the former a deep light loam, that of the latter a rich deep strong loam.

1. *Soil.* The soil adapted for the cultivation of hops, is, in all cases, a deep rich loam, or a peat ground, well drained, consolidated and manured; many hop-grounds upon the Teame river are within reach of the floods, and have occasional irrigation; this is reckoned no inconvenience, but the contrary, less manure being, in that case, necessary.

An idea is pretty general amongst the buyers of hops, that those from strong loams are possessed of the greatest condition, strength, or staple, and will go the farthest in use; they are, therefore, generally preferred to those from weaker soils.

2. Rent. The rent of hop-grounds is seldom distinct from that of the other parts of a farm, but may be reckoned from 30s. per acre for upland, to 50s. on that fit for meadow, from its situation and staple.

3. *Exposition.* The aspect of hop-grounds in this county should be to the south, south-west, or west, and sheltered to the north and east.

4. Preparation. When hop-grounds are formed from grass-land, it must be either dug with a spade, or ploughed by the paring plough, which buries the sward, and goes full ten inches deep. Tillage land for this purpose must be well cleaned from weeds, and

thoroughly manured; there are two forms of laying the land, the one by the plough in ridges, from seven to eleven feet wide, according to the richness of the soil, most room being given in the best soil; the other in tumps, by hand-work, laid out in the quincunx form, from four feet and a half to seven feet, from middle to middle; this tump-work, I understand, is seldom practised, except where the plough cannot go, from uneven, short, or sloping ground; it has, however, one advantage, the whole of the ground can be occupied, whereas in ridging, headlands must be left for the horses to turn upon; but the tumps must be wholly cultivated and cleaned by hand-work: they are formed round, flat at the top, about two feet diameter, and wider at the bottom.

5. *Shelter.* Hop-grounds require a sheltered situation, but withal to be sufficiently open for a free ventilation, and to receive all the benefit to be derived from the sun and air; but they would not succeed on bleak exposed ground, as they require warmth; their shelter is the natural hills and slopes of valleys, together with the fences of the enclosure.

6. *Manuring.* Rich pasture ground, when cultivated for hops, requires, at first, little or no manure; and hop-land, within reach of the winter-floods of rivers, without being too much so exposed, has a source of manure from nature; but old tilled lands require to be well manured with good rotten dung, or compost; soil and lime is sometimes used, and reckoned good manure. Mr. Crane reckons his hop-ground to require manure once in two years, at the rate of six good cart-loads of rotten muck per acre, worth 7s. 6d. per load; this is 1l. 2s. 6d. per acre per annum for manure.

7. *Planting.*

7. *Planting.* Mr. Crane's hop-ground is mostly planted in ridges of seven feet asunder; five roots put near together are called a stock, and are about three feet and a half from middle to middle of each stock on the ridges; the roots, when planted, are from three to six inches long, with two or three shoots in each; no produce the first year, but green crops cultivated in young hop-yards, as pease, beans, cabbages, turnips, and potatoes. A hop-yard well managed will last twenty years.—*Mr. Crane.*

Fruit-trees here, on every fourth ridge, at eleven yards in the rows, which is about forty-eight on an acre; this assists the hop-culture in profit. An acre of hop-ground is not by measure, but one thousand stocks are, in all cases, deemed an acre, and the labour paid for by that rule. An acre of Mr. Crane's hop-ground contains only 2 rods and 10 perches; each stock has two poles, or two thousand poles to a nominal acre.

Mr. Crane has some short ground planted in tumps, about five feet from middle to middle, a stock of five sets or roots in each tump, and two poles to each stock, as in the ridge-work. One thousand of these stocks, or tumps, are called an acre as before, which, at five feet by measure, contains the same as before, or about 2 rods, and 10 or 11 perches.

'Squire Smith's hop-yard, No. 1, in the Vale of the Teame, is in nine feet ridges, and four feet in the rows from stock to stock; one thousand stocks thus occupy 4,000 square yards, or 3 rods and 12 perches of land to the acre. In another of his hop-yards, No. 2, the ridges were eleven feet, and stocks in rows three feet six inches; this is 4,277 square yards, or three rods and twenty-one perches per hop-acre. Mr.

Smith had about five hundred weight of hops, this year, 1807, from each acre.

In the hop-yard last named, are fruit-trees in every fifth ridge, and at fourteen yards in the rows, about twenty-four per acre.

In another hop-yard, I observed a row of potatoes between each hop-ridge, and turnips are sometimes sown, when hops fail; tumps here at five feet, and sometimes at six feet.

Wheeler's hop-ground, rented, with a farm, from Mr. Smith, was thirty acres; but part now cultivated for other uses, or laid to grass; ridges here eight feet, stocks three feet six inches in rows; this is two rods and twenty-three perches per acre.

8, 9, and 10. *Sort, Management, and Cultivation.*—The general division of the sorts is into the red, green, and white. Amongst the local, or provincial distinctions, Mr. Pomeroy has named the Golding-Vine, and Mathon-White. Mr. Crane named to me, as favourite varieties, in addition to the red hop, the non-pareil and Kentish grape; but these distinctions I suppose to be local and provincial, and not capable of conveying general information.

The first year green crops, as above, are cultivated on the skirting of the ridges, and the hop-plants are three times kerfed, to mould and keep them clean, but are not poled; the second year they are poled about May-day, and may produce half a crop; the third year, and afterwards, they are supposed in perfection.

The regular annual cultivation afterwards is,—the ridges are ploughed down in March, or the tumps kerfed down, and the manure worked in; also the hop-plants on ridges kerfed where the plough cannot go; they are afterwards plough-hoed, or kerfed, three times

times during the summer, to mould the plants and clean away weeds.

Poles, Poling, Tying, &c. Two poles are used to each stock, two thousand to an acre; they cost 8s. per hundred, and about two hundred upon an acre annually, or one-tenth of the whole, are reckoned to wear out; they are tied to the poles with rushes, at 4s. per acre. The ordinary cultivation, including plough and hand-work, is done at about 16s. per acre, and may be let to be done at that price.

The *Distempers*, to which hops are subject, are blight and mildew; for the prevention, or cure, of which, no remedy is known; they are supposed entirely dependent on the seasons, as a crop is very precarious, and subject to changes so sudden, as to baffle all human care, or foresight. In the month of July, a sudden blight has been often known to raise the price of the stock in hand in a few days, sometimes to double their former value; and the dealer, who has before been pushing off the article, in expectation of the price lowering, has, on a sudden, locked up his warehouse, and refused to supply his customers.

Picking. This is done by women and children from the neighbouring populous counties, or from Wales, principally in September. Women hop-pullers have 8d. per day and breakfast, or 9d. without, and three pints of beer, or cyder, each per day; eight pluckers to a crib in three days pull an acre; expense, 18s. to 24s. (*Mr. Crane*); but this depends upon the bulk of the crop in some measure; the operations of drying and sacking are well described by Mr. Pomeroy.—See his Account.

The *Expense* attending the hop culture is pretty considerable;

considerable; Mr. Crane enumerated the following expenses attending it:—Firstly, original planting in ridges, per acre 2l.; this is to be repaid by the green crops attending it, or by future profit.

Ordinary Expenses.

	Per Acre,
	<i>£ s. d.</i>
Cultivation with the plough and kerf	0 16 0
Poles, 2,000 to an acre, cost 8l. interest of capital	0 8 0
— 200 per acre, wear out annually, at 8s.	0 16 0
Tying, per acre, 4s.; picking, on the average, 1l. 4s.	1 8 0
Drying and cokes, 7s. 6d.; rent and taxes, 2l.	2 7 6
Manure as before stated	1 2 6
Cloth for sacking, 1l.; tithe, 1l.	2 0 0
Duty at 2d. per lb. suppose 6 cwt. per acre	5 12 0
Drink	0 10 0
	<hr/>
Total	15 0 0
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If the produce be less, the duty is of course less; but I strongly suspect the picking and manure to be under-rated, if not the general culture; and that the annual average expenses are not less than 15l. per acre; the rent too is here put low.

The duty is now 2d. per lb. it has been 2½d. but the planters beginning to break up the hop-yards for corn, it was reduced to 2d.; it has been this year, 1807, laid in speculation at 80, to 86,000l. but I have not heard the real amount.

Tithe. The rector has a right to collect the tithe of hops in kind, if not otherwise agreed with; he may take every tenth basket when green, or when sacked and dried, may take every tenth sack; allowing 25s. per hundred for drying, sacking, and duty.

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With respect to produce of hops, it is extremely various, (see DISTEMPERS,) many hop-yards have sometimes none ; this year, 1807, is reckoned about, or hardly, half a good crop ; the produce generally, from two to four, or five hundred weight per acre, average about three hundred weight ; in a full hit of hops, the profusion (like that of fruit) is very great, ten hundred weight per acre common ; and even a ton upon an acre is said to have been grown.

Profit and Loss Account. Of this, in the hop-culture, it is difficult to form an accurate estimate ; Mr. Pomeroy estimates the average produce at six hundred weight, and the price at 3l. 10s. making 21l. per acre ; I suspect the produce thus to be too high, and the price too low ; but five hundred at 4l. 4s., four hundred weight at 5l. 5s., or three hundred weight at 7l., will either produce the same result, viz. 21l. per acre ; and if the average expenses be 15l. per acre, this would give 6l. per acre profit to the grower, which is not too much for an article that requires so much extra attention and exertion, especially when we consider that the family expenses are to be paid in part from it. I should be rather inclined to take the average produce at five hundred weight, at 4l. 4s., which would, upon 6,000 acres, produce 1,500 tons, at 84l. Amount 126,000l. as the annual produce of the county being, as before, 21l. per acre.

That there is a fair profit to the grower, may be supposed, otherwise the culture would cease ; but, it is very certain, that much more has been gained by speculators in this article, than by the growers ; what has been gained by the latter, has been chiefly by men of property, who could bear stock, and keep their produce till it would bring a good price ; to do which, they

they must sometimes have two or three years stock in hand.

Respecting the antiquity of this culture, it is not very great. Dr. Nash says, hops were imported from Flanders till Henry VIII., and their culture introduced into England during that reign; consequently, they have been of English growth about three centuries.

It is stated, by Mr. Malcolm, in his Account of London, that, in the reign of Henry VIII., one hundred weight of the best hops were bought for 6s. 4d.

The Worcestershire prices, 1807, as follow:

Memorandum.—At Worcester Market, September 26, 1807, new hops, 6l. 6s. to 7l. 7s.; 1,280 pockets sold.

At Stourport, September 30, new hops, 6l. to 7l.; 99 pockets sold.—They afterwards fell to the following prices:

At Stourport, October 28, 5l. 5s. to 6l. 6s. per cwt. 137 pockets, weighed from 1½ cwt. to 1¾ cwt. average weight.

At Worcester Market, October 31st, 5l. to 6l. 6s. per cwt. 433 pockets weighed.

Note on Hops. Mr. Smith, of Erdiston, informed me that he had broken up a good deal of hop-ground, and thrown it to corn and grass; and thinks it pays better so applied, when corn takes a good price; it is generally thought the breadth of hop-ground has declined, though some new plantations have been made; others think the hop-ground remains nearly the same as for some years back.

Mr. Crane informed me, that when the hop-duty was raised to 2½d. per lb. the planters began to break up the hop-yards in earnest; but the halfpenny per lb. being

being taken off, they desisted. He believes they will not bear any further advance of the duty.

Mr. Pomeroy's account of the cultivation and management of hops, in this county, is as follows:—

“ The hop plantations of this county are, in general, a pattern of neat and excellent husbandry. A very general and judicious experience, and the most persevering industry, have placed its management, in this particular, on the most respectable footing; and though something may be as yet reserved to engage and recompense the future exertions of the ingenious and industrious, it may be asserted with truth, that the peculiar, or more general produce, of no part in the kingdom, has been cultivated with a greater variety of experiment, and emulous exertion, than the hop-plantations of this and the adjoining county. The different sorts of this valuable plant, cultivated here, are ranged under three general heads: the red, the green, and the white. A various cultivation, the real source probably of these first distinctions, has introduced a variety of different species, though differing little more than in name and degree, of the same colour, shape, and size. There are two, however, in more particular esteem, both with the planter and merchant; the Golding-Vine, brought from the neighbourhood of Canterbury, and the Mathan-White, the name of which denotes it to be a native of this plantation, and of the parish of that name. The most hardy, that which will flourish with the least attention, and is least liable to suffer from the seasons, is the red; perhaps the original stock. The next in this line, is the green; which is also the most productive. The tenderest, though, at the same time, the most valuable, is the white. The plantations of this county are principally to the west of

of the Severn, increasing as they approach the banks of the Teame, and the confines of Herefordshire. The situations preferred, are a gentle descent, with a south, south-west, or western exposure, screened at a distance to the north and east by high ground, or plantations of timber; but not so as to prevent a free ventilation: the soil, a deep loamy land, or strong clay, after it has been thoroughly limed and manured: but above all, a boggy soil, when completely drained, and duly meliorated, is said to produce the best hops.

" When meadow or pasture ground is broken up for this purpose, it is either dug, or the sward, being first pared thinly off by the paring plough, is buried by the furrow plough, working full ten inches deep. Old tillage, when converted into hop grounds, requires to be very completely cleared of weeds; to be thoroughly manured, and to have the ridges, provincially lands, entirely levelled. The different manners in which they are worked, are, the tump, and the ploughed grounds; the former by hand, and the latter by the plough: those are laid out in the quincunx form, each tump being at the distance of from five to seven feet from the centre of each other. On these the distance between the stocks is from three to four feet; that between the rows, from seven to nine; the greater or less space being always allowed, as the land is either richer or poorer. In the ploughed, if the circumstances of the ground will admit of it, the rows run mostly north and south, with the view to admit the sun more generally, when it has most force; but should it be long and narrow, its greatest length extending east and west, that direction is preferred: there are those who give it the preference, when not influenced by any accidental circumstances, as receiving

ceiving the morning sun, by which the chill of the night is soonest dissipated. The sets are procured from the shoots, or roots of the stocks, at the annual time of dressing, the latter end of March, or beginning of April. They must have two joints each, the roots striking from that in the ground, and the vine shooting from that above. Four are planted to a stock; at the distance of about four or six inches from each other, all inclining or pointing, so as to meet together in the centre.

" There are two methods observed in planting young hop-grounds: the first, and more general, is, to plant the sets on the situation in which they are to remain, immediately after they are parted from the old stocks. In the other, the sets are planted in nurseries, in rows about three inches asunder, with about five or six inches between the rows; here they grow till the month of October, when they are transplanted into the hop-ground. Under this latter management, if the roots are good, one will be sufficient for a stock. In removing them, great care must be taken to make the opening to receive them so large, as not to confine the roots: when planted from the stocks, a hole made with a peg, to place them in, is all that is required. The nursery has certainly great advantage; besides the saving of a considerable expense, where the sets are to be purchased, the land may be worked through the summer, to prepare it for the plantation. During the first year, the grounds are ploughed, or hoed, provincially kerfed, three times. They produce no hops; but a good crop of pease, beans, cabbages, or turnips, is obtained between the rows. The second year they are poled and yield half a crop; the third year, they are in perfection. When they have reached this state,

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the management is uniformly as follows:—They are gone over, mostly four times, with the plough, or kerf, beginning about March. The first business is to throw down the tumps, and rows of the former year, and to work in the manure, previously brought on in the winter. This consists of fresh earth, rotten dung, or a compost of dung, earth, and lime, judiciously proportioned, according to the nature of the soil; each acre receiving not less than sixty cart-loads, for a good dressing—it is repeated, according as the nature of the land renders it necessary. The stocks are now pruned, the remains of the old vines, and superfluous shoots, are removed with the hop-knife. The second moulds up the tumps and rows; the succeeding ones complete the moulding up of the plants, and destroy the weeds. The tumps are formed round, flat at top, and about twenty inches diameter, and somewhat broader at their bottom. The ploughed lands are thrown up much in the same manner as for potatoes, or beans, only higher, and with more soil. The shoots begin to appear in April, and the poles are pitched the latter end of the same month, or beginning of May. These are set two or three to a stock, at a foot distance from each other, with great regularity and exactness, and inclining a little outwards, over the alleys. Some attention is necessary, in this part of the business, not to over-pole the plants, either in number, or the length of the poles, as it weakens them; and by drawing the vine out to too great a length, renders them less productive. About the close of this month, and beginning of June, women are employed to direct the vine to the poles, and tie them with dried rushes. This is continued till they are out of reach. The only care now remaining is, to keep under the weeds, and to go over

over the plantations occasionally, to replace any vines that may stray, and repair any damage the plants or poles may have received from the weather. When they have reached their full growth, which is, in some measure, regulated by the number and length of the poles, the side shoots put out. The method of topping the vines, to promote the lateral shoots, said to be practised in other plantations, is never used in this.

" About the second week in September they ripen, when the hop-pulling begins. In a plentiful year, it continues six weeks, more or less; according to the crop. The cribs are now placed, beginning on that part which lies most exposed to the sun, as being soonest ripe; one, two, or more, as the proprietor's plantation is large or small, and he has the convenience of kilns to dry them. Each crib has eight or ten pickers, women and children; they pick, if there is a tolerable crop, and they are any ways industrious, from six to eight bushels each per diem, which is about a sackful (the sack in which they are carried green to the kiln); eight of these sacks, when dried, make about one hundred weight; but in some seasons, though no ways negligent, they will fall short of one half of this quantity. The pickers come from the neighbouring counties; but the far greatest number out of Wales; some from thirty to forty miles distant. From the cribs, the hops are conveyed to the kilns, four or five of the sacks alluded to before, at a time, on a horse, and are dried as soon as possible; they damage considerably, if suffered to lie long together before they are put on the kilns. They will heat in six or eight hours, and lose colour; to avoid which, the kilns are kept constantly employed day and night. The time the hops take in drying, is from eight to twelve hours, according

ing as they are ripe and dry. Great attention, and considerable judgment, are necessary in this part of the business; the whole of the year's expenses and labour, and at times, property to some amount, being at stake on a single kiln—it is usually entrusted to those who have been long used to the practice. The general principle on which they proceed, is to begin with a very gentle fire, till warmed through; the heat is then gradually increased, and continued till the core (fruit stalk) is quite sunk and dry. They are then removed, and thrown together in a heap, in a corner of a large room appropriated to this purpose, and frequently turned from one side to the other, in order to cool them completely before they are bagged.

"The method of bagging is as follows:—A strong hoop is made fast round the mouth of the sack, which is then let down through a circular opening in the floor, made for this purpose; a few are first put in, when the man, who is principal in this part of the business, gets in, and by constant treading, presses them down as close as he can. A second person is employed in breaking them (that is, tearing the flowers, &c. from the fruit stalk) and throwing them into the bag as they are wanted: thus they proceed till it is full, when the mouth is loosened from the hoop, and closed, leaving at each corner of the sack a space for the hand, for the better convenience of those who are employed in carrying them.

In the grounds, nothing more is done, but stripping and piling the poles; these are always set up in them, about three hundred in a pile, sloping and propping each other, the better to withstand the wind. Different opinions are entertained respecting the superiority of the tump, and plough-management; the former

former has certainly the advantage in many particulars, and is said to be cheaper and more productive: but as it is impossible, from the present extent of the plantation, that any considerable proportion can be worked in this manner, from want of hands, the inquiry cannot be of much consequence. The expenses of these plantations, may be calculated from the following statement:—As they always occupy the most valuable tract on the farm, the rent cannot be set down lower than 31s. per acre, in some instances it is much higher. The acre is not to be estimated as statute measure, but after the rate of one thousand stocks to the acre, which is, in general, one-fifth less. The expense of manure is very heavy, as they produce none, except the ashes from the burning of the vines and leaves; so that were justice done to the rest of the land, the greater part ought to be procured from home. The price of dung (provincially muck) in general, is about 6s. per waggon-load, or 3s. per ton; (if from stables, in which horses are fed plentifully with corn, the price runs higher in proportion) and is frequently to be fetched eight or ten miles.

"The hop-grounds are worked sometimes through the several seasons, as they are termed, at a fixed price, which is, from 15s. to 20s. per acre, according to the different quality of the soil. The seasons are four, and thus divided:—throwing down and cutting, spreading and pitching poles, kerfing and tumping, stripping and piling poles: otherwise the workman receives his usual pay of 1s. per day, with drink; or some parts are taken by the acre, as pitching poles, 3s. stripping and piling 2s. 6d. to 3s. 6d. The women employed to tie the vine receive 6d. per day, with two quarts of drink; or they take them by the year,

year, at 3s. or 3s. 6d. per acre. The hop-pullers receive from 6d. to 8d. per day, with a pint of thickened milk, or something similar, for breakfast every morning; two quarts of drink per day, and two dinnens every week. The pole-man, he who brings and removes the poles, has all his meals, drink, and from 4s. to 6s. per week. The coal (pit-coal coaked) with which they are dried, is also an expense of considerable consequence; it is chiefly procured at Pin-sax, in this county, at a distance of several miles from some of the plantations, where it costs 2½d. or 3d. per bushel; twenty-eight bushels are a ton, and it takes two tons of coak to dry one of hops. The drier is paid from 12s. to 21s. per week, varying according to the number of kilns he has to attend: he has also his meals and drink. He who has the management of the bagging, is paid 4d. per cwt. exclusive of his assistant. There are different articles used for bagging: the Lubecks, and a sort of cloth manufactured at Dudley, in this county, are the most in use, and chiefly the latter. The price varies according to the demand. The Lubecks are dearest; they cost, in general, from 28s. to 34s. per piece, and are thirty-six yards long, and about 31 inches wide. The Dudleys cost from 22s. to 32s. and are of the same dimensions, each piece making eight sacks, four yards and three quarters long.

" Most of the estates which grow many hops, have plantations in which the poles are raised. Ash and barked oak are preferred; but willow, poplar, and alder, are also used. Where the estate does not produce a sufficiency, they are bought at the woods and coppices in the neighbourhood, at from 5s. to 15s. per hundred: their length is from eight to eighteen or twenty

twenty feet, proportioned to the goodness of the lands ; they last, with care, seven or eight years. The sets, when bought, cost from 6d. to 2s. 6d. per hundred. The last expense is the duty, which is 1d. per pound, and 15s. per cwt. on the produce. The average of the expenses in general, is thus estimated : that of workmanship, from 25s. to 30s. per acre ; those of picking, drying, charcoal, sack, and duty, 30s. per cwt. The implements used throughout this plantation are, the plough, the kerf, the spade, iron crow, and the hop-knife. The plough is the common one of the district ; the kerf is a large hoe, with a plate about nine inches broad, and thirteen deep ; the spade needs no particular description ; the crow is an iron bar, about four feet and a half long, generally square at top, with a large point, in the octagon form, used to make the hole in the ground in pitching the poles ; the hop-knife resembles in make the sickle, an old one being often converted to this purpose, by grinding off its saw-edge, and giving it a sharp one in its stead ; when made with new metal, it is something smaller. The crib, into which the hops are picked, is an open frame made of wood, standing about four feet high, four feet broad, and nine long. To the upper edge of this, is fastened the crib-cloth, which is nine yards double, made of the same stuff as the bags, but coarser and cheaper. The sacks in which they are conveyed to the kiln, are the same. The kiln will be afterwards described.

When the hop-grounds are come to perfection, it is the general practice to exclude every other growth, and trust them alone, for a return of the great expense at which they are cultivated. Under this management, those which have been uniformly attended

to in their prime, and not weakened by over-poling, will continue to produce plentifully, from twenty to thirty years; and in some instances, much longer, care being taken to replace the stocks that accidentally decay. On the other hand, fresh grounds are generally allowed to produce the finest hops, and in greatest abundance. A question of some difficulty arises, at what time it will answer best to give up the old, and plant new grounds; this must at last be determined by the peculiar circumstances of each plantation. But the error of continuing the old, as they often are, years after they have passed their prime, is self-evident. The first expense of the new, may weigh with the occupier, who holds his farm by the year, or for a short term; but this is not the case with many of the principal planters. The same observation holds good with respect to the fruit plantations: these are often suffered to encumber the grounds, when there is scarce a hope left, that they may produce a crop anywise adequate to the expense of continuing them. This has given rise to the following practice; and were it universally adopted, it would probably prove advantageous to the planters in general.—The young hop-grounds are planted at proper distances with fruit trees; these, from the frequent turning the soil and manure, are found to thrive better, and of course come to perfection sooner, by this, than any other management followed in this county. The constant attention to the fences necessary for the hops, is of the greatest service to the trees, by protecting them from their greatest bane—the teeth, and rubbing of cattle of every description. For years, there can be no doubt but the advantage to the trees, more than compensates any loss the hops sustain, considerably.

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Later, it is true, the trees prove prejudicial, by the spreading of their roots, and by their branches intercepting the light and heat of the sun; preventing also a free circulation of air. This, however, will not happen in any considerable degree, till they are fifteen or twenty years' growth, the time when the hops, under this management, may be expected to decline; and it will be necessary to apply the land to the purposes of which it is most capable as an orchard. In this method, there would always be a constant succession of young vigorous plantations of both produce. Those years in which the hops fail, some return for the great labour and expense they are attended with, might be looked for from the fruit; a larger proportion of the land would share in turn, that extraordinary attention which is now confined to those parts on which the hops are grown. The crops of these would probably never rise so high as they occasionally do now; but it must be remembered, these are not those which pay the planter best, as all the expenses on the produce are the same, on a given weight, whatever price it bears. Moreover, the average produce of the plantations is now said to exceed the consumption: in the great years, such as the present, so much so, as to reduce the price so low as scarcely to repay the planter; they are, nevertheless, increasing: those of this county, within the last three years, have added one hundred and fifty acres to their former growth; and this, notwithstanding there appears but little prospect of any new markets for them being found: a very serious consideration, and highly deserving the utmost attention of the planters. If this statement proves true, the following practical inference may be with certainty drawn from it—that it will be adviseable to forego

some of those points which are particularly calculated to assist the crops of hops alone, in favour of a produce, the value and consumption of which are constantly increasing.

The circumstance of those hops which are most in request, ripening all at nearly one time, is a considerable inconvenience, both to the owner and holder of the estate: as they damage so soon, whether left on the wires when ripe, or gathered, if not dried immediately, it is necessary to have buildings, and a number of kilns, in proportion to the size of the plantations, and more hands during the season, than would be otherwise wanting. Could those sorts which ripen earlier or later, be improved, or any others introduced, that do so, it would be a considerable acquisition. The parts necessary to perfect the seeds, are found on different plants, and as the greatest stress is laid on these, it may be proper to notice, that the practice of removing the barren stocks, may be carried too far: it is an inquiry well worth attending to, whether this may not be the cause, in some instances, of the early decay on some grounds.

The following observations of Dr. WITHERING (Bot. Arang.) on the honey-dew, deserve to be introduced to the notice of the planters.—“ If the hop-yards were covered with stones, the plants would be less liable to suffer from the honey-dew, or from the otter-moth; for the honey-dew is the excrement of a species of louse (*aphis*); but these insects seldom increase so as to endanger the plant, unless it is in a weak condition; and the larva of the otter-moth at the roots, first occasion the plant to be sickly. Now, when the hop grows wild in stony places, and fissures of rocks, where the moth cannot penetrate to deposit

" posit its eggs, the hop is never known to suffer from
" the honey-dew."

Under this view of the disease, might not the practice of smoaking the fruit plantations, on the first alarm of a blight, used in some fruit countries, be applied here to those of hops? The other injuries to which they are liable, still remain without a remedy. A free circulation of the air through them, and complete draining of the land, are the only dependence. The use of the kerf is attended with one disadvantage, and which, when employed, almost solely, to destroy weeds, is of consequence: the person working with it, in some measure, defeats the intention of his labour, as he is continually treading down the soil again, he has just loosened; and thus, in some degree, re-sets the weed he had but a little before turned up; but the greater despatch made with it, more than can be done with the spade, will probably continue it that preference in which it is held.

The tythe of hops is more particularly complained of than that of any other article, and considering the very great expense at which they are cultivated, it appears to be with reason. The present regulations respecting the hop duty are not complained of; and if the tax must be continued (to use the language of the planter) it cannot probably be altered for the better; the only use of consequence to which hops are applied, is the preserving malt liquors. The shoots called hop tops are introduced, in spring, as a vegetable at table, and somewhat resemble asparagus. Strong cloth is made in Sweden of the stalks; for this purpose they must be gathered in autumn, soaked in water all winter; and, in March, after being dried in a stove, they are dressed like flax.

The construction of the kiln is as follows: the brick-work rises perpendicular from the ground, to a height sufficient to admit of about two or three feet below the bars, or grate, on which the fire is made, and about six or seven above it; the dimensions at the base vary according to the size required for the grate, and to give the brick-work sufficient strength to support the superstructure; the height of this is determined by that of the building, when it is not erected new for the purpose; at the top of the perpendicular brick-work, iron bars are fixed at right angles; on them are laid tiles, or large flat stones, where they can be procured, these are covered on the upper side with a coat of mortar; the name given to this part of the kiln, the spark-stone, sufficiently denotes its use; it is placed in the centre, and of such size as leaves room around it to admit the heat above, at the same time that it prevents the sparks from the fire being carried there; from this part the brick-work becomes wider, overhanging gradually for about four feet, in a funnel-shape, when it again rises perpendicular about two feet; here joists are worked in at small distances from each other, and on these, laths are nailed, forming the floor; the brick-work is continued a foot higher, forming a breast-work round the top; on the floor, and round this breast-work, the hair-cloth is spread in which the hops are contained.

Dr. Nash thinks hop-ground a species of farming, taken for a number of years, injurious both to landlord and tenant; a few acres swallow up the manure of a farm, the crop is very uncertain and precarious; on which account, the landlord often gives long credit for rent; it gives the tenant a turn for gambling and speculation, which frequently proves his ruin; it is injurious

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jurious to the timber, by occasioning it to be lopped and cropped for poles, which it is not easy to prevent.

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CROPS NOT COMMONLY CULTIVATED.

Asparagus. Grown upon a considerable scale in the neighbourhood of Evesham—saw several flats in the fields; it is principally carried to the market of Birmingham, though at near thirty miles distance.

Cucumbers. Grown, too, in large flats, in the enclosures north of Evesham; and disposed of as the foregoing article, principally at the market of the town of Birmingham.

Onions. Grown in the same rich enclosures, and to supply the same demand; a prodigious quantity are sent to the Birmingham Michaelmas fair; an acre together, or thereabouts, are sometimes saved for seed, as I observed, in the enclosures north of the town of Evesham.

Poppy Heads. A field of two or three acres of this plant (*papaver somniferum*) was growing at Norton, three miles north of Evesham, September 6, 1805; more than half the field had the heads cut off and carried away, the remainder were growing, and the seed ripe. A girl, who lived near, told me they were sold to the druggists.

Clover for Seed, is grown in considerable quantities in various parts of this county; and, from its appearance in many cases, seems to be upon the aftermath, or second crop, which tends to impoverish the soil, and is by no means the true system. Where clover is intended

intended for seed it should be grazed down to the end of the first week in June, and then fenced up, after dressing over the field, levelling dung, &c. The seed-clover of this year, 1805, was generally harvested the end of September, and beginning of October; the crop promising, and well got together, the weather having been favourable for that purpose; also, September, 1807, saw a piece of seed-clover very promising, at 'Squire Smith's, of Erdiston, in the west of the county.

TIME OF HARVEST.

The harvest of this county is early, particularly on the fertile soils, which include the sandy or light gravelly soils in the north, and the deep rich clay or loam in the middle, south, and west of the county. There is, in the air and climate of these parts of Worcestershire, a mildness, softness, and salubrity, which brings to perfection the fruits of the earth, a full fortnight earlier than in the country thirty miles north; insomuch, that it has been usual for reapers, from Cheshire and Lancashire, to assist in the reaping of Worcestershire, afterwards in that of Staffordshire, and to get home in time for that of their own country. In Worcestershire the fertile clays, though apparently inclined to wet, are thus early, as well as the sandy and gravelly soils; the present season, 1805, I take to be a fortnight later than average; and, from showery weather, the harvest nearly a fortnight longer in continuance, than in a settled season; the harvest was pretty generally begun Monday, August 5, and as generally

generally finished by the end of that month. In the Vale of Evesham, a clay soil, nothing remained out the first week in September, except the beans, which were generally cut or cutting, and some small scatterings of the blue cone wheat, which is somewhat later than the lammes; but in the higher grounds, and north-east of the county, the grain was only about half cut, and very little carried.

The bean harvest, this year, was the middle of September, and finished by the end of that month; the seed-clover was got the end of September, and beginning of October. Hops have almost totally failed, and fruit only a small partial bearing.

July 23, 1807. Wheat reaping near Kidderminster; rye and pease also cut.

27th. Barley mowing at the same place.

August 3d. Barley carrying; a whole field cleared.

6th. Wheat reaping become very general in the Vale of Evesham.

At Fladbury, barley and pease had been harvested.

By the middle of August, harvest generally finished on the early farms, and in the middle and south of the county, and elsewhere, by the end of that month.

Beans and seed-clover got in, in September; also the hop-picking finished in that month very generally.

CHAPTER VIII.

GRASS.

SECT. I.—NATURAL MEADOWS AND PASTURES.

THE natural grass-land of this county is very considerable; the Vale of Severn, as before observed, contains, very probably, ten thousand acres of a deep rich soil, in some places as level as can be conceived, to a large extent; upon this land great numbers of sheep and cattle are fattened. I have seen a large meadow of this rich soil almost covered with sheep; the verdure too is early in spring, and late in autumn; and where it is sufficiently elevated, to be pretty well secured from floods, it is very valuable for mowing for hay.

The banks of the Avon, the Teame, and the Stour, abound in rich meadow and pasture land; in some parts similar to the former, in others thinner of soil, and inclining to be swampy. The county is also intersected in all directions with smaller rivers, brooks, and rivulets; whose margins consist of good meadow and pasture. I have observed, in some of these low-lands, cattle fattening and doing well, notwithstanding the appearance of rushes and aquatic plants. The soil originally, from the rich upland, has a fertility, and gives

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the grass a staple, which affords a nutriment to cattle, superior to what is given by the same herbage in poorer countries.

As this land is adapted either to mowing or grazing, any proportion of it may, with a little management, be mown at pleasure, and more hay is produced in Worcestershire than it consumes; the surplus finds a ready market for horses employed on the canals, or in the mines of Staffordshire.

Mr. Darke, of Bredon, says, our old pastures abound with honey-suckle (*trifolium repens*), yellow craisey (*ranunculus repens*), crested dog's-tail (*cynosurus cristatus*), ray-grass, &c.

Mr. Marshall, who examined the grass-land of the Vales of Severn and Avon, with attention; at the proper season, gives the following as the principal pasture herbage:—Ray-grass (*lolium perenne*), white clover (*trifolium repens*), trailing trefoil (*trifolium procumbens*), barley-grass (*hordeum pratense*), Timothy-grass (*phleum pratense*), crested dog's-tail (*cynosurus cristatus*), sedge-grasses (*carex's*), vernal grass (*anthoxanthum odoratum*), meadow fox-tail (*alepocurus pratensis*), flote grass (*festuca fluitans*), tall fescue (*festuca elatior*), creeping bent grass (*agrostis alba*), fine bent (*agrostis capillaris*), marsh fox-tail (*alopecurus geniculatus*), meadow soft grass (*holcus lanatus*), brome grass (*bromus mollis*), meadow-grasses (*poa's*), meadow-burnet (*sanguisorba officinalis*), meadow-vetchling (*lathyrus-pratensis*), meadow-clover (*trifolium pratense*), bird's-foot trefoil (*lotus corniculatus*), creeping crowfoot (*ranunculus repens*), orchard-grass (*dactylis glomeratus*), quake grass (*briza media*), besides some other coarser grasses, neutral plants, meadow-flowers, and weeds.

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On a farm called the Sink, lately purchased and taken in hand by A. Lechmere, Esq. the grass-land being a moist loam, on a clay bottom, and having been neglected, a good deal of coarse herbage appears; the season was unfavourable for examining it, but I could discern the following: dyer's broom, provincially here wood-wick (*genista tinctoria*), thorny rest-harrow (*ononis spinosa*), wild carrot (*daucus carota*), and rushes; these Mr. Lechmere hopes to destroy by draining, top-dressing, and rooting up, without ploughing up the land to bring it to a proper herbage.

SECT. II.—ARTIFICIAL GRASSES.

The artificial grasses usually sown here are red and white clover, trefoil, and ray-grass; or, on the vale land, sometimes hay-seeds from the loft; these are sown in the spring, and most commonly with barley, but sometimes with wheat.

At Wolverley, Mr. Knight always lays his land to grass with barley after turnips; the seeds are about eight pounds of red clover, six pounds of white ditto, and two pecks of ray-grass, to an acre, seldom any trefoil. At Worley Wiggorn, upon high cool land, Mr. Richard Miller sows eight pounds of red clover, eight pounds of white ditto, and a bushel of ray-grass, to an acre; the land to lay several years at pasture: where land is sooner broken up, it is usual to sow ten or twelve pounds of red clover, three or four of white, three or four of trefoil, and only a peck of ray-grass, to an acre; but the quantity sown varies according to

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the nature of the soil, and the judgment of the occupier.

Mr. Darke has converted five hundred acres and upwards of arable land into pasture, and greatly increased its value. He lays down with white honeysuckle (*trifolium repens*), eight or ten pounds to an acre; all other seeds except trefoil are injurious in these soils; six or eight pounds of trefoil to the acre assists for one year only.

Experiment.—A piece of seeds having missed, Mr. Knight had it ploughed up in August, and laid down with seeds upon the one ploughing; the soil a light sandy loam: no other crop was sown, but four tons of lime laid on per acre; the produce judged not worth standing, was ploughed up the spring following for turnips. *Observation.*—Wheat, or rye, might have been sown, and seeds in the spring might have done better; or rye, or vetches, for sheep pasture, might have been followed by turnips.—*W. P.*

Mr. Pomeroy observes, “the grasses chiefly cultivated to prepare pasture lands, are the red and white trefoil, with a mixture of natural grass-seeds. The following excellent mode of laying down grass-land, is adopted by Mr. Wakeman, of Buckford. Having prepared the land by a good summer-fallow, of at least three ploughings, he provides a collection of the choicest of the grass-seeds, which are found to flourish most upon the places adjoining to the land intended to be laid down. These seeds are obtained in the proper season of the year, at a small expense. The sorts principally made use of, are the *anthoxanthum odoratum*, the *poas trivialis pratensis et annua*, *alopecurus pratensis*, the *cynosurus cristatus*, and the white, red, and

and yellow trifoliums, adding to the whole mixture a small quantity of the lolium perenne. After having sown the barley, these seeds are combed in with a light pair of harrows. By this method, the ground is immediately stocked with native grasses, without waiting years for their spontaneous production. In the winter of the second year, the seeds are covered with a meliorated compost."

SECT. III.—HAY HARVEST.

The hay harvest commences here early: in the present late season, the spring having been retarded by cold winds, I saw a new hay-rick in the Vale of Severn, Monday, June 24, 1805, which had been made the week before; but, from the showery season, the whole of the hay harvest was scarcely finished in July.

In the month of April, 1804, I had occasion to ride into Worcestershire; towards the dusk of the evening, observing something differing from common appearance upon some meadow-land, I alighted to examine it, and found it the young shoots of meadow-flowers, chiefly cowslips, nothing of the kind having appeared in Staffordshire. The common meadow-flowers, the cowslip, the hyacinth, the anemone, and the ladysmock, appear a full fortnight sooner in the meadows of Worcestershire, than in those of Staffordshire, at half a degree more north, but probably at 300 or 400 feet more elevation.

The hay-harvest for both natural and artificial grasses, is in the months of June and July, according to the season.

No particular process is used in the making of hay; that from artificial grasses is kept turning in the swathe till dry, and then got together in cocks, when it is fit for carrying to the stack. Meadow-hay is made here, and I believe every where, by the same process; after mowing, it is spread over the whole ground, which is called tedding; against night it should be raked into win rows, and then into small cocks; next morning when the dew is off, the cocks must be again spread, and the hay afterwards turned; when, if it has been fine weather, it will be fit to cock and carry; otherwise the last process must be repeated another day, before it be carried to the stack.

Dr. Nash observes, that the grass-land of this county is better managed than the ploughed; but that grass upland ought not to be too frequently mown, not more than once in three years; unless such land be frequently top-dressed with dung or compost. The produce of hay in this county may be reckoned, from one to two tons per acre, and on water-meadows sometimes more.

SECT. IV.—FEEDING.

This is principally done in the fields and meadows, the staple of whose soil is sufficiently rich to fatten the various kinds of sheep and cattle, and their verdure continuing the greater part of the year; when grass fails, assistance must be had from hay and turnips, as well as oil-cake. The hay produced from some of the uplands of this county, is (as I have been informed) of a very nutritive quality, and well adapted for

for feeding cattle; and stall-feeding is considerably practised in this county; and some considerable experiments have been made by individuals. Mr. Darke, who was himself occasionally a stall-feeder, says, Mr. Lechmere will average more than 30l. each, for thirty oxen bred in Herefordshire; this was in 1794: these gentlemen are, I understand, both since deceased, and the grazing concerns consequently in other hands.— See CHAP. XIV.—LIVE STOCK.

In December, 1807, I paid a visit to the Lechmere estates, and was, with great liberality, shown the feeding cattle-stock; the capital grazing farm of Severn-end, formerly occupied by Mr. Lechmere, sen. is now in the occupation of — Terret, Esq. and the present Anthony Lechmere, Esq. has, in hand, considerable grazing occupations, at his residence of the Ryd, and again at the Sink, and at Timberden-farm; the grazing business is conducted by both these gentlemen, with great spirit and judgment, on a large scale.— See CHAP. XIV.

The cattle drawn from the dairy, as well as a considerable number of Welch, and some Herefordshire, are fattened by the summer-grass, finished by aftermath; and, if not then sold, continued on hay, and sometimes turnips given out of doors, till they are disposed off. Stall-feeding is generally applied to the larger kinds, or to Herefordshire oxen; these latter are generally worked in their native country till six years old, or sometimes older; they are turned to grass, for fattening, at that age, after the barley seed-time, and are to be bought at the fairs of Herefordshire, from spring to autumn, in different stages of forwardness.

On the approach of winter, after having had the summer-grass, they are taken to the stalls; the kinds
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of food principally used for stall-feeding here are hay, corn, oil-cakes, and linseed ; the best kind of hay in this county, is said to bring on cattle nearly as well as grass.

The species of corn used are barley and beans, ground, and given dry alone, a limited quantity per day, at stated times, with a supply of water for the animal to drink at pleasure.

Where oil-cake is given, hay is sometimes cut with wheat-straw, and given between the meals of cake, by way of cleansing their mouths, as well as to correct the over richness of the cake ; one man is supposed sufficient to attend and take care of twenty head of oxen.

The season of stall-feeding is, during the absence of grass ; three meals of hay per day, and two of cake between, are generally given, with water always within reach ; the quantity of broken cake given at a time, a quarter of a peck ; but it is sometimes given oftener per day ; but care should be taken not to cloy the animal. In regard to the progress made, an ox is expected to get fat in ten or twelve months ; and, if bought in May or June, after the summer's grass, to be ready by stall-feeding, for Smithfield Market, by Candlemas, Lady-day, or May-day, according to the disposition of the animal, and state of the market.

They are seldom, however, kept the whole of the winter in stalls ; the most forward bullocks only being stalled the beginning of the season ; the rest being fed in open yards, or, perhaps, with hay only in the field, and the forwardest of them taken up as the stalled bullocks go to market.

If the last stalled bullocks are not finished sufficiently for the market before the spring grass is fit

to receive them, they are sometimes transferred from the stalls to the fields; but this is not deemed an advantageous practice, nor do they often come on well, unless the cake be continued to them at grass.

When oil-cake has been advanced to an extravagant price, some spirited individuals have tried linseed itself boiled to a jelly, and mixed with flour or bran, and it is said with good success; linseed oil is also said to have been used in the same way; the principal objection to linseed jelly, is said to be the trouble of preparing it.

The market for these cattle, which are mostly fed in the south of the county, is Smithfield, whither they are driven in about eight days, the distance about one hundred miles, at the expense of about 10s. or 12s. per head, salesmen and toll, included.

The above, in part, from Mr. Marshall.—See CHAPTER XIV.

CHAP. IX.

GARDENS AND ORCHARDS.

BESIDES the domestic gardens attached to houses in the country, are tracts of garden ground near the principal towns, for the supply of their markets ; particularly near Worcester to the north-east, where there are considerable gardens and nurseries; and near the town of Evesham to the north, where are considerable garden grounds for the raising of all the usual garden plants, as well as onions, cucumbers, and asparagus, for the supply of the neighbouring markets, and the town of Birmingham ; there is now supposed to be near three hundred acres of land, under the garden culture in the neighbourhood of Evesham ; and from these premises, asparagus, and early pease, are sent to Bath and Bristol, as well as to Birmingham ; from sixty to eighty horses have formerly been laden in a day with garden stuff for Birmingham market ; but the roads being now improved, it is sent in wheel-carriages, with a much fewer number of horses.

The rent of garden ground near Stourport, and other populous towns, is 2s. 6d. per perch or rod, of eight yards square, this is nine guineas per acre ; the produce can be worth little more than rent and labour ; but a garden is a convenience, as well as a source of amusement.

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This price given near towns, shows that every country labourer can afford to give as much, or more, for garden ground, than it is let at to the farmer; they should, therefore, always have so much garden ground for potatoes, and other vegetables, as they can cultivate without losing time.

A top-dressing of lime on garden ground, is supposed to be useful in destroying grubs; and I have observed that a garden well cultivated, and kept clean by repeated hoeing and weeding, is less liable to the depredation of insects, than one neglected, or suffered to get foul and weedy.

Orchards have been long and successfully cultivated in this county, particularly in the middle, south, and western parts; where they are to be found, in the neighbourhood of towns, villages, and farm-houses; and the various kinds of fruit-trees are often dispersed over the country in hedge-rows, and form one of the productive articles of a farm.

Fruit is an article of uncertain or casual production, some years producing little, or nothing, more than a supply for the table; of which sort is the present year, 1805, in which, cherries have borne a high price, selling in the markets from 6d. to 9d. per lb.; plumbs are tolerably plentiful: of apples and pears, a slight scattering, sufficient for the table, or the supply of the markets only; little or none for cyder or perry; walnuts and chesnuts, a pretty full crop.

In a plentiful year, or what is called a hit of fruit, the profusion is so very great, that in remote places, upon bad roads, the fruit will not pay for collecting and carrying to market, nor can casks be procured for containing the whole of its juice, so that large quantities are devoured by hogs, or suffered to rot on the ground,

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ground. In such years, the cyder will scarcely pay for pressing out and carrying to market; I have heard of its having been carried many miles, and sold in Worcester market for a guinea per hogshead, though cyder in the inns at Worcester has been, at the same time, 1s. per bottle; it pays no duty whilst it remains in the hands of the grower, but upon sale it is subject to an excise.

Dr. Nash observes, that two or three tons of cherries are often sold in Worcester market, on a Saturday morning before five o'clock, and that six tons have been known to be sold there in one morning; they are carried to the neighbouring towns, also to Birmingham, Wolverhampton, and to Lancashire and Yorkshire.

I have been very credibly informed, that in some such year, the sum of 2,000l. has been paid for tonnage of fruit upon the Trent and Severn canal, passing to the north. The length of the canal is forty-six miles, tonnage is paid 1½d. per ton per mile; the quantity passed must, therefore, have been near seven thousand tons.

The cultivation of fruit in this county is of considerable antiquity; it is known to have been celebrated for fruit, in the reign of Henry III. near six hundred years ago.—*Dr. Nash.*

MR. POMEROY ON THE FRUIT PLANTATIONS.

The fruit plantations do not share, in any proportion, the attention paid to the hops; such, indeed, is the natural fruitfulness of the soil, and so congenial to the growth of fruit of every kind, that it flourishes, even where most neglected, in a manner unknown to

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most other districts; of course, necessity, the first spur to exertion, is wanting. Many circumstances, however, unite now, to fix the attention of the county on this article of its produce.

The plantations may be considered as consisting of those in the old orchards, and those of later date; of those under the present improved management in the hop-grounds, and the single trees, either in hedge-rows or elsewhere. The old orchards are by no means deserving of particular notice, except for the strongly contrasted light in which they place the improvements already adopted, and to point out those which may be more abundantly introduced. There is no variety of soil or situation, surface or aspect, through the county, that has not its plantations under the old system. The leading circumstances of the present management, to judge from them, were much undervalued by our ancestors. They severally abound with a variety of the different kinds of apples or pears, and sometimes of both; and are much crowded, their greatest distance being, whether in pasture or tillage, twenty feet between the rows; and on an average, much less betwixt the trees (frequently, no order in the planting is discoverable); the heads, of course, have not sufficient room to spread, but are much entangled with each other, and form a shade so thick, as to injure materially, not only the fruit, but the crops also that grow beneath. In many instances, there is scarce an evil to which they are liable (though easily remedied with moderate attention) by which they have not suffered in a great degree. If the bark has escaped the teeth, not a solitary instance occurs, where the trees have been preserved from the rubbing of the different cattle that have access to them. They are universally

versally over-run with moss, and often encumbered with a considerable weight of mistletoe, and decayed wood: such is the condition of many, from age and neglect, that they ought to have been replaced by young plantations long ago.

There is but little that can be added, respecting the trees growing in hedge-rows: the practice is now generally condemned, and given up, for reasons too obvious to be mentioned. Those of long standing, partake of all the defects of the old orchards, so far as their situation will admit; the same may be said of those scattered up and down the farms, or found in small clusters, the remains of former small enclosures.

It is from the plantations of later date, more particularly, that the following observations are drawn:— Different soils are well known to influence both the quality and flavour of the produce; some attention has been paid, in this particular, but by no means all that it is capable of; the size to which the several trees naturally grow, and the predominant characters of the fruit, being but little attended to, in fixing on them for the culture of the different sorts. Those preferred are, the deep loamy lands, and strong clays, when perfectly dry. The former, on the soft sandy stone, which prevails in some of the western parts of the county, though without any considerable depth, is esteemed particularly well adapted for cyder plantations. The gravelly clays, frequent in many parts, are also deemed favourable. Marl, when duly meliorated, is in much esteem; perhaps, strictly speaking, many of the plantations, said to be on a clay soil, are growing on a meliorated marl. These are what are preferred, and are even necessary for apples. The pear will also do well on most other soils.

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The situations are generally chosen, so as to avoid the extremes, which either expose too much, from their elevation, or are liable to suffer from moisture, by being low. A gentle declivity, and south or south-west aspect, with a view to secure them from the chills of the north and east, is sought for: some distant screen also to the west, to protect them from the violence of the winds proceeding from that quarter, is required. No preparation of the ground, for planting, is made, beyond that which occurs in the common course of husbandry.

The stocks are generally raised from seed obtained from the crab, or kernel fruits, and mostly bought at nurseries. The price is from 8d. to 1s. 6d.: the management of them must of course be uniform; the only object with the nursery-men, being to procure strong, upright, handsome plants, without any view to their future application, as to the different kinds of fruit which they are to bear; some are also procured wild from the woods. They are planted at about eight or ten years growth, seven or eight feet high, and about four inches girth; in this situation, they remain, in general, three years before grafting, as it is esteemed the best practice, to graft after they are transplanted to the spot on which they are to continue. The time of performing this, is in the months of March and April. The methods chiefly used are, the stock and saddle grafting. In the former, the head of the stock being sawed off, and two or more openings made with the saw, and afterwards smoothed with a knife, an equal number of grafts are secured in them with clay, or the common soil of the ground, tempered into a paste with water. In the latter, the head is also taken off, and the graft bestrides its top, which is shaped

shaped up into a sharp edge to enter it, and is secured as above. When this method is adopted, it is always done at a much earlier period, and generally in the nursery. The grafts are mostly procured from the same, or some neighbouring plantation. In taking up and re-planting, the setting of the tree upright is all that is attended to—but little method is observed in either cutting, or placing the roots; the soil is returned as it came out, and if the ground is pasture, the turf is carefully replaced: they are then supported by one or two stakes driven into the ground, reclining towards them; to which they are tied with a band of hay or straw. In the hop-grounds, no further security is required; but, in those lands that are liable to be stocked, they have either thorns fastened round them, or a frame to protect them; these frames consist sometimes of three stakes, standing triangularly with cross pieces; at other, of only two, but considerably broader than the former, and furnished in the same manner with cross pieces. This, however, must be understood of the superior management; it is too often wholly omitted; or, having been provided at first, is afterwards neglected. In the hop-grounds, and more modern plantations, the distance usually observed between the rows, and betwixt the trees, is from thirty to forty feet. From this time till they reach their full growth, the only attention they receive is, to train the trunk upright, and to clear the head from the low hanging boughs, in order to place them as far as may be, out of the reach of cattle. Pruning the trees, and clearing them from decayed and useless wood, is, in some degree, continued afterwards. In about five years from grafting, they begin to bear; and in about thirty years, are supposed to attain their prime, and

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to continue in full vigour thirty years more. Pear-trees, remain for a still longer period ; in many instances, they are known to have produced plentiful crops when a hundred years old. The produce of the different sorts of fruit, varies considerably—an apple-tree that yields a hogshead of liquor, is deemed a great bearer ; where, as, instances have occurred, of a pear-tree affording three hogsheads, of a hundred and ten gallons each. Most plantations have their trees, that, in a tolerable year, give a hogshead each. The apples in most esteem are, the red and yellow stire, golden pippin, bland-rose, red streak, different sorts of quinnings, rennets, margils, pear-mains, &c. &c. The pears are squash, huffcap, barland, linton, &c. As a general characteristic, apples of a yellow or red colour, both within and without, are preferred.

The management of the soil varies in nothing from that pursued on those parts not planted ; the same succession of crops is observed on the arable, and the grass-grounds are either mown or grazed as usual ; nor is the choice of manure influenced, but by the circumstances of the soil. The different fruits, and their several kinds, ripen at different times ; including the early sorts for the market. The season begins about June ; but the fruit harvest, more strictly speaking, for the general orchard fruits, not till the beginning of September, for pears, and the close of the same month for apples. Their falling spontaneously from the tree, is the only criterion by which they judge of their ripeness. Two methods of gathering are observed—the one is, hand picking, when they are taken from the tree singly by the hand, so as to avoid every risque of bruising them. In the other, and more general way, they are shaken off with long poles having hooks, with

which they lay hold of the boughs ; or, when more force is necessary, they are beaten off with the poles. The first method is usually followed with the fruits designed for the table, or the market ; these are generally gathered before they are fully ripe. The latter is universally adopted in gathering those for the mill ; in this also, the trees are always cleared of the whole of their produce at once. That which is designed for the table at home, or for the market at a later season, is laid up dry on the floors of large rooms, strewed with straw ; in frost, they are covered with it, and are examined occasionally, to prevent, as much as possible, the accidental decay of any from injuring others. That designed for the mill, is collected together, even the choicer, in large heaps, near the mill, in the open air, and on the ground : the two last circumstances are particularly insisted on, to prevent too great fermentation before they are ground. But little care is taken to keep the several sorts apart : a particular quarter of the general heap, is the chief distinction ; a partition with a board is sometimes made, but this is only for the prime fruits. The size of the heap is very uncertain, as no means are employed to confine them ; in the centre they usually rise to the height of three or four feet. In this state they remain exposed to the weather, till they are judged to be mellow ripe. Should not the whole be made into liquor before the frost sets in, as is often the case in great fruit years, the heaps are carefully covered with straw, to preserve them from it.

What follows, with respect to the making of cyder, must be understood as relating to the general practice of the county. When deemed in a proper state, the fruit is conveyed into the mill, and ground with great care, so as to reduce the whole pulp, rind, and kernel,

so much as may be, into an uniform pap. When removed from the mill, it is thrown into a vat, where it remains for a day or two, till some degree of fermentation is observable. It is then put into separate hair cloths, each being, when the sides are raised over the contents, about six inches thick; and from six to ten of these are placed, one on the other, beneath the press where they are continued, under a most powerful pressure, so long as any juice can be forced from them. The liquor is then put into other vats, and when the grosser fæces have separated, it is drawn off into casks of sixty-three gallons each, leaving both the scum that had risen to the top, and what had settled to the bottom, behind. This, being strained through a three-corner bag of linen, or woollen cloth, is added to the other liquor, and is supposed to be the best of the whole. This last part of the process is omitted till after the principal part of the liquor has been racked once, or oftener, as it is found necessary to check the fermentation; and the fæces separated at each time, collected, and the whole strained as above. The liquor thus gained by straining, is found to possess considerable power to retard fermentation; it is accordingly added to each vessel, in proportion as it seems more or less disposed to ferment. The refuse from the press in plentiful years, is thrown away; but in those of scarcity, it is mostly ground a second time, with water; and the liquor procured, is used as an inferior family beverage, called, provincially, *washings*. In very scarce years, it is not to be supposed but the cyder-house has its obligations, in point of quantity, elsewhere, as well as to the trees. The management of the fermentation and fining, is an art so refined, so enveloped in mystery, that mortal language is not equal

equal to the describing of it; though communicated some way or other to numberless votaries, they have all acquired it they know not how; of course they cannot, perhaps will not, give any information on the subject. This much is certain, no borrowed ferment is used, and the fining is variously conducted with white of egg, isinglass, ashes, sand, bullock's blood, or red earth, according to the suggestions of the several genii who may be supposed to preside over this part of the business.

The dimensions of the buildings vary according to that of the plantations. The construction of the mill is this:—A heavy round and flat stone, running round on its edge in a circular trench, sunk in several others closely joined together: the fruit is thrown into the trench, and ground by the weight of the circular stone rolling round, and drawn by a horse. The dimensions of the bed, or horizontal part of the mill, that in which the trench is made, in one of a middle size, is about ten feet diameter, and stands about twenty inches from the ground. The depth of the trench, is from eight to twelve inches. On the inner side, it rises perpendicularly, the outer sloping so as to give about four inches greater breadth at top than at bottom; by this means the fruit, when crushed from under the roller, rises chiefly on that side, and is more easily returned into the centre by the person who follows, generally a woman or child, who also attends to the horse. The returning of the fruit into the middle of the trench, is sometimes effected by fastening a piece of wood, used for the purpose, to the mill work. The size of the circular stone, or roller (that which runs in the trench) in a mill of these dimensions, is about four or five feet diameter, and about fourteen inches thick;

thick ; the weight varying according to the texture of it, from one ton to one ton and a half. An axle-tree passes through the centre of the roller, one end of which extends sufficiently over the bed of the mill to admit of a horse being fastened to it : the other enters an upright shaft, which has a circular motion by means of a pivot in some beam or bearing of the floor above ; the bottom has a similar motion on the centre of the mill. The axle-tree has also a rotary motion in the shaft, and again in that part to which the horse is fastened. Thus a circular and rotary motion is obtained. In this state, however, which is by far the most general, the machine is incomplete, as the roller frequently slides along the trench, forcing the fruit before it. To obviate this defect, a cog wheel has been added, in several instances, to the inner arm of the axle-tree, which, working in the teeth of a corresponding wheel fixed on the surface of the bed, this motion becomes equally certain with the other. Another improvement, lately adopted, is this—the inner edge of the roller is sloped off, so, that when standing in the trench, it forms with the bed of the mill a level, by which means the circular motion is much eased. The rotary motion is also much assisted. The press is constructed on the same principles as every other perpendicular press : short levers are used at first, afterwards longer ; and at last, a long iron bar. To increase the purchase, a strong rope is ultimately fastened to the end of the bar, by means of an open noose, and secured from slipping off by a pin ; this rope communicates with an upright post in a distant part of the building, moving on pivots at each end ; the lower, in a hole of the floor, the upper, in some of the timbers above : this post has also openings about three or

four feet from the ground, to admit levers, by which it is worked, and the utmost force required is obtained. A cast iron screw has been lately introduced instead of the wooden one—no inconsiderable improvement.

The only defect complained of in the mills, is this—they do not always break the kernel sufficiently (it must certainly be very difficult to fix so small, hard, and slippery a part, when dispersed through large quantities of soft matter in machines of such dimensions), nor is it probable any improvement of the present simple, but excellent construction, can wholly obviate it. Nor do the different contrivances, hitherto proposed seem likely to be very generally adopted. Such, however, is the price the more perfect liquors bear, as to make any moderate additional expense not of material consequence. In preparing these, picking the fruit, so as to separate that which has been damaged, is particularly recommended by the first managers. When this is done, might not the person thus employed, with a circular scoop, take out the core of the apple with but little additional trouble? The form of the instrument conceived under this idea, is as follows: the cutting part of it cylindrical, open at both ends, half an inch or rather more in diameter, and about two inches long; from each side proceeds an upright piece, three inches, or something longer than the largest fruit, to give room for the core to fall out between the top of the cylindrical part and the handle: this is formed by these two pieces meeting in the middle, and entering a cross piece of wood. It is conceived, that with little practice, this might be used with considerable expedition by children, at very low wages: bone would be the most eligible material to make it of. Should metal be used, the inside of the cylinder

cylinder might be armed with two or more cutting edges, crossing the diameter, or rising along the inside; these would serve to divide the core still more. The kernel, thus separated from almost the whole of the pulpy part of the fruit, would, if ground by itself, be with more certainty brought under the action of the mill; or would be reduced with much less trouble, by any of the other machines that are used, or have been proposed, for grinding fruit. The method of using it would be this—a piece of deal, or any soft wood, must be fixed before the person employed, on which to rest the fruit, while the scoop is forced through it, and a pail, or bucket, underneath, to receive the core as it drops from the scoop, each forcing out that which preceded it. Should the idea, as thus stated, be approved, it may be carried still farther. The fluted iron rollers, used in some parts of Herefordshire for a cyder mill, might be adapted to this grinding of the kernel; and contrived, without much additional machinery, to work with the present mill, or the construction of the malt mill could be easily applied; the nut being fixed on the inner arm of the axle-tree, the box secured by a support, projecting above and below from the upright shaft. All this, however, is only conjecture, no attempts having been made as yet, to put it in practice. Should it be found to answer, or lead to any other improvement, by directing the attention of the ingenious to this defect of the present mill, every end proposed will be fully attained.

The stone of which the mills are made is not met with in any part of this county; they are procured from several parts of Herefordshire; the nearest is Bromyard-down, a distance of about eleven miles from Worcester. Those most in esteem, are brought out of Wales.

Wales. The price of the stone, worked at the quarries, is 20s. per foot; that is, a mill, the bed of which measures ten feet in diameter, costs 10l.; the expense of setting up one of these dimensions, 4l. or 5l.; the price of the hair-cloths for a press, to a mill of this size, is from 5s. to 6s. each; they measure about three feet six inches square, and last, with care, twenty years or more; the mills, a hundred years and upwards.

The superiority of the mills of this district over those generally used in Devonshire, has been already noticed; and so very obvious are the advantages they possess, that it appears matter of much surprise, they should not have hitherto supplied the place of their very imperfect contrivance to break the fruit—this being the most the mills of that county can be said to do. The benefit derived to the liquor, from the rind and kernel, appears to have wholly escaped the observation of the cyderists of that district, and is certainly the reason of their sending the fruit to the press so very imperfectly reduced as it is in their present practice. The hair-cloths employed here in the press, should also supersede the reed and straw used there. They are not only more convenient, but, on the whole, considerably cheaper; the reed for a hogshead of 63 gallons, costing, on an average, 6d. seldom less.

There are other circumstances in which the fruit management of the two counties varies considerably. The following instances may possibly be found deserving the attention of the planters of this.—The orchards of Devonshire are wholly appropriated to this produce; no other crop, except now and then a little garden stuff, is ever expected from them. It is, as before observed, a general clause in their leases, that they shall not be stocked; and though horses, and

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perhaps calves, and pigs, are turned in, in the spring and beginning of summer, it is mostly a trespass upon the covenant. Sheep are universally excluded ; and this, from a well-grounded apprehension, that the grease, or whatever it may be they leave on the trees after rubbing against them, is peculiarly prejudicial.

Upon the first surmise of a blight, they collect the coarse grass of the orchard, or any other material that in burning produces a considerable smoke, and with this they fumigate the trees. Myriads of insects have been known to be destroyed in this manner. The fruit is gathered as it falls from the tree ; no force is used till the leaves are mostly fallen, and all employed then, is shaking with the hand, or striking between the larger branches with a slight pole. It is, if possible, collected when dry, and housed in a loft over the mill, separated frequently with partitions, all opening by sliding boards into one part, in which there is a hole, through which it is let down into the mill ; as that gathered first is placed nearest the opening, it of course is also ground first. No respect is had to quantity ; whatever the loft will hold, is placed in it without scruple. The circumstance of much rain falling on the fruit when separated from the tree, though totally disregarded, or rather recommended here, is considered there as one of the most fatal accidents that can befall it. If the loft over the mill is not equal to the whole crop, what remains is laid up in other buildings.

As some liberty has been taken, in reprobating what appears to be the general management of the county, with respect to the fruit plantations, the following observations are offered, with great deference, to the consideration of the planter.

The advantage of situation is thoroughly understood, and though there is some difference of opinion as to aspect, the leading principles are well ascertained; and will no doubt, in due time, be universally carried into effect. The general outlines, with regard to soil, are known and observed, but there appears room for improvement in the filling of them up; that is in the appropriating of the several soils which are fit for fruit; to secure and improve the discriminating qualities by which each of the superior sorts is distinguished. Trees which naturally grow to a large size, planted on a shallow soil; austere fruit on a strong clay; and that which is dry and spongy, on a crude marl, are errors often met with, very obvious, and easily avoided. The stock should be raised under the eye of the planter, or under his who has a still greater interest in the success of the plantation, the proprietors of the estate. In the nursery, a proper distinction should be made of those raised from the seed of the crab; those from an austere, and those from more mellow fruits; that they may be each applied to the growing of fruit of that character they suit best, or may be most likely to improve. There certainly is no sufficient reason why those from the crab should be uniformly preferred; the others may, without doubt, in many instances, have a preference: they decay sooner, but they also come to perfection sooner; and when the seed is selected with care from young vigorous trees, as that of every kind ought to be, are found to possess every requisite to form handsome and lasting plants. Owing to inattention in adapting the stock to the size of the tree it is intended to support, it is very common to see the upper part of the trunk, that growing from the graft, several inches larger in girth than the lower; that which

which remains of the stock, forming a considerable projection where the graft was inserted. Great care should be taken in the choice of stocks, independent of that to ascertain the seed from which they are raised. At a very early date, a pretty accurate judgment may be formed of the future success of the plant; at two or three years growth, many will be found to put out thorns; others will be disposed to throw up shoots from their roots; both should be invariably removed immediately.

An improved practice in grafting has been lately introduced, and deserves to be more generally adopted. Instead of taking off the entire head of the stock, it is left on till the boughs are large enough to receive the grafts. An injury to which the trees in general are liable (splitting in the crown) is by this means, in a great measure, avoided. The common soil, or clay, used to defend the grafts, is apt to crack, and fall off in dry weather; and a compost of sand, and new cow or horse dung, would be an useful improvement. The absorbent system of plants being now generally admitted, it is an inquiry worth attention, how far the practice of taking off the whole head of the tree, in grafting, may prove prejudicial to its growth. The spare trunks of the lopped elms of the district, stretching out their small heads to the length they do, in quest probably of nourishment they have been deprived of, certainly countenance the suspicion.

In preparing the ground, something more than the mere sinking of a hole capable of receiving the roots, ought to be done. The openings should be made at least two feet deep, and for some considerable time before-hand (the longer in reason the better); the earth, more particularly that from the bottom, should
be

be repeatedly turned ; if the soil be of a stiff marly nature, till it is completely reduced. They ought also to take in a circumference exceeding that of the roots, in order to give the young fibres sufficient room to extend themselves through the meliorated soil : six inches is the depth at which trees ought to be set. In planting, the hole should be nearly filled up with some of the inferior soil ; on this the sod, which will probably be nearly rotten, be laid, and the roots spread with care immediately on it. A necessary precaution is this, that they do not cross each the other, and that they extend as much as may be, equally in every direction : the remaining mould should be then returned, throwing the best, that from the former surface, round the outer part of the hole, and working it carefully in among the extreme roots. To those who have been accustomed to plant in the usual manner, these directions will, perhaps, appear trifling and unnecessary ; they are recommended, however, not as a plausible theory, but as the result of a very considerable experience. Watering the holes before planting, and the trees after, has been practised, and it is said with advantage ; but the time and labour this requires to do it properly, or rather so as not to prove injurious, must exclude it from the common practice ; it will be, however, right, to pay attention to the nature of the soil, and if dry, or of a very loose nature, to plant rather in the months of October and November, than in the spring.

The following instance of successful management in this particular, deserves to be recorded, more especially, as there are many situations in this county that now lie neglected, on which it might be adopted with every prospect of success. The ground planted was in pasture, with a gentle declivity ; the soil, a shallow

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strong clay, on a solid calcareous marl. About the middle of March, circular holes were opened, about four feet in diameter; the sod, with the surface soil, to the depth of about six inches, was thrown up on one side, on the other, that beneath, so as to leave an opening two feet deep: during the summer, the whole was repeatedly turned, and as winter came on, the earth being then dry, was thrown up separately into round tumps, by the sides of the opening; on the approach of the following spring, small gutters were made level with the bottom of the holes, opening on the surface below, so as to carry off all the water that could collect in these basins formed in the marl. In planting the trees, the method already recommended was observed; and in the following winter, a circular trench, two feet wide and two deep, was dug out round the outsides of the first openings; the soil left exposed, and turned as before; and the ensuing summer, it was nearly filled with furze, before the soil was returned into it, with the view to keep it loose, and by that means invite the shooting of the roots. The gutter was also extended, and carefully preserved. On the adjoining ground, the situation and soil exactly similar, a plantation was made in the usual manner, the trees being set when the openings in the first were made. The latter was repeatedly manured, and managed throughout with attention: on the former, no manure has been used. The trees of each plantation were young and thriving, about the same age when planted, and every other circumstance, exclusive of the method of planting the same. The result of the experiment, for such it may be called, though accidental, is this—the trees of the former plantation are at this time (about fourteen years from the first opening of the ground) full twice the size,

size, some even three times, that of those in the latter, which are nevertheless allowed to be well grown. The difference of the produce is equally great. One circumstance, however, ought not to be omitted; and may probably be thought to have contributed, in some measure, to the superior growth of the former: they are trained so as to form low spreading heads, branching off at about two feet from the ground. The latter, on the contrary, to form what has been termed the upright besom head, with a stem about five feet long, which is the usual height in the more western parts of the kingdom.

The only motive that induces to guard the trees, appears to be the apprehension of their being torn up by the wind, or barked whilst young, by the cattle. The mischief done to them in every stage of their growth, by the rubbing of the cattle, is totally disregarded. Such, however, is the opinion entertained of it in another fruit district, that, as has been before stated, it is usually an article in their lease, that the plantations shall not be stocked at all, principally with a view to obviate this mischief. Here are two extremes; perhaps both equally remote from the point of good management. This much is certain, that the continuing the fences round the trees in the grass grounds, and keeping the stock of every kind off the tillage, after the crops are removed, and when fallowed, would be amply recompensed by the growth and fruitfulness of the trees.

The inconveniences attending the gathering and sorting of the fruit from orchards, where they are growing promiscuously, are so evident, that future planters will undoubtedly avoid them, by appropriating separate spots to the several varieties,

The

The present generation has to regret a great want of attention in their predecessors, in the choice of their fruits, in a considerable proportion of the aggregate plantation, a total neglect; this consisting of the bare spontaneous production of accident, notwithstanding they had fruits to choose from, perhaps equal to any art can produce. A just idea of the importance of this neglect may be formed, by comparing the great difference in the price the better and inferior sorts bear, and will no doubt have due influence with the planter of the present day. Indifference in this point, would be the more unpardonable, as it is not for future ages alone he plants; he often lives to share abundantly the cheering offspring of his labour.

When young orchards are planted out of the hop grounds, and the distances now recommended are observed, might not cherries be advantageously planted in the rows between the apple trees? It is said to be practised in some fruit districts, and with success. They bear, and reach their full growth, much sooner than the latter, and produce a very lucrative crop. In the neighbourhood of Worcester, there are about twenty acres in cherry orchards, now in perfection; ten of which are known to be let for 100l. per annum, the remaining ten are not in any respect inferior to the others, and probably bring, nearly at least, the same rent; and yet, such is the demand for the fruit, that the market, three times a week, opens by three or four o'clock in the morning, and is generally cleared before seven.

It appears extraordinary, that a doubt can possibly arise, whether or no the two additional crops of the fruit and hop districts operate ultimately to the advantage of the occupiers. In this county, about six thousand

and acres of hop-ground, and, perhaps, about a third of this quantity (two thousand acres) may be estimated as adequate to the injury the ground crops sustain from the trees ; these making together eight thousand acres ; and may be supposed to produce this year, calculating by the former statement of the exports, as follows :—

By hops (the lowest average price cannot be set down, now, at less than 3l. 10s. per cwt. and six cwt. per acre	- - - - -	£126,000
By fruit, 58,125 pots, at 4s.	- - - - -	11,645
By cyder, 10,000 hogsheads, at 3l.	- - - - -	30,000
By perry, 1000 ditto, at 5l. 10s.	- - - - -	5,500
Amounting in the whole to	- - - - -	£173,125

which, upon 8000 acres, is considerably more than 21l. per acre.—See the article *Commerce*.

To this may be added, a saving in malt to a very considerable amount ; and yet a doubt is very generally entertained, whether or not the tenantry at large is benefited by these crops ; yet the same number of acres, under a common course of husbandry, in no instance in this neighbourhood, produces a sum equal to this, even after allowing for the more frequent failures to which they are liable. One circumstance, relating to the fruit, as more particularly striking, may here be mentioned, which is, that the fruit plantations have not been considered, by the more numerous part of the planters, as producing an article for the market ; provided they are fortunate enough to get the enormous supply of liquor necessary for the home consumption, without having recourse to the maltster, they rest satisfied.

As

As cyder is subject to no tax in the hands of the planter, and till it becomes an article of traffic, it has but little advanced in the average prices for a number of years; the fluctuation in its price, though considerable, seems wholly owing to the plenty or scarcity of fruit. The following price of cyder, from the planter, for a number of years, such as is generally used in London, and in public-houses, is communicated by Mr. Hooper:

	Highest Price per Hhd. 110 Gallons.	Lowest Price per Hhd. 110 Gallons.	Average.
	£. s. d.	£. s. d.	£. s. d.
From 1769 to 1781	5 0 0	1 1 0	2 6 0
From 1782 to 1794	5 0 0	1 1 0	2 18 0

The above average price is produced, by adding together the price of each year, and dividing by the number of years; the most dear years occurring in the latter period.

Dr. Nash observes upon these estimates, that 6000 acres of hop-ground is too high a calculation for the county of Worcester; but if it includes the Worcestershire Excise Collection, which takes in part of Herefordshire, &c. it may be near the matter.

He also observes, that the calculation on the profits of cyder, perry, and fruit, are certainly too high for an average of years; and that for four years past fruit has produced little or no profit, but he has declined giving any other estimates; I can, therefore, only observe, that in a good year, or hit of fruit, the amount of produce is much greater in quantity than here stated; but if several bad years succeed, the average amount will be less, and that in a good year, the fruit and its produce has been generally sold by the grower, at less than a fair average price.

As the extension of orchards, and improvement of fruit, and the liquor obtained from it, seem objects of considerable national importance, more especially, if the quality of the liquor could be so improved, as to supersede, in some degree, the importation of foreign wines, and its quantity so increased as to lessen the immense breadth of land sown with barley, I shall beg leave to make some abstracts from Mr. Marshall's observations, who made this fruit district his residence, more than once, for some length of time, for the particular purpose of obtaining information on this subject, and for a more minute detail, see his *Rural Economy of Gloucestershire*--Article, *FRUIT*.

I assume with him the commonly received, and I believe established, maxim, that all our sorts of apples are varieties of the wilding or crab (*Pyrus malus*), and all our sorts of pears, varieties of the wild pear (*Pyrus communis*) ; and that all these varieties have been at different times accidentally raised from the pippin or kernel of the original fruit, or from each other.

Dr. Withering says, (I know not from what authority,) that the cyder apple trees were originally brought from Normandy. Miller, who had great experience in fruit, says, there are not above two or three sorts of French apples much esteemed in England, which are the rennets and the violet apple, the other sorts being early fruit, which will not keep long, and generally mealy ; and we have many better fruits raised in England, which he enumerates, and amongst them the golden pippin, and other prime sorts.

Mr. Biggs, Nurseryman, Worcester, advertises the new scarlet nonpareil, and the new Blenheim orange apple, as in high estimation, 1807.

Mr.

Mr. C. recommends to the farmers' attention, the culture of wall-fruit, as far as he has opportunity, particularly pears of the best kind, peaches, apricots, nectarines, and cherries, as well as strawberries. He says, soap-water, after the family washing, is good for fruit-trees; by applying it in the winter, he has rendered a barren vine fertile in grapes; also asparagus, mushrooms, garden beans, pease, chamomile flowers, elder berries, red and white, cucumbers, and early potatoes, are very profitable, and worthy the farmer's attention, as well as turnips for seed; garden-ground, well attended to, being more profitable than any other.

Apple and pear trees thrive and bear well, only a few years, on light soils; to remedy this, a succession of fresh young trees of the best sorts should be provided every six or seven years; light soils will produce crabs, medlars, servins, quinces, and the Siberian crab, much esteemed for making of tarts, or eating, when kept till mellow.

Cherries, plums, damsons, and all stone fruit, will do well on light soils, as will also filberts, which meet a ready sale, and pay better than any fruit whatever; they have the advantage of not being molested by birds, and should be reared from the slips of grown-up trees, and will bear well in a few years: the filbert does better to grow as a standard, than in the bush way.

Mr. Marshall gives the following as the apples most esteemed for making cyder; after observing, that the old fruits, which raised the fame of the liquors of this country, are now lost, and the red streak is given up:

1. The Stire Apple; this is going off, the stocks canker, and are unproductive; fruit somewhat below the

the middle size ; colour, pale yellowish, sometimes a faint blush on one side ; flesh firm ; flavour, when ripe, fine ; a good eating apple ; the cyder rich, highly flavoured, and of a good body ; price often four times that of common cyder.

There are also varieties, called the red stire, the yellow stire, and the kernel stire, which, being probably kernel fruit, and bearing some likeness to the true stire, have had this name improperly given to them.

2. The Hagloe Crab is next in esteem ; it was produced about the year 1718, in a nursery, among other stocks raised from seed, by Mr. Bellamy, of Hagloe, in Gloucestershire, grandfather of the present Mr. Bellamy, near Ross, who draws from trees, grafted with this variety, a liquor which, for richness, flavour, and price, on the spot, exceeds every other fruit liquor which nature and art have produced : he has been offered 60 guineas for a hogshead of 110 gallons on the spot ; the fruit is nearly white ; when ripe it has a yellowish cast freckled with red on one side, about the size of the stire apple, but more oblong ; the flesh soft and woolly, but not dry ; juice sweet when ripe, but not in great quantity ; flavour resembles that of the Caskew apple of the West Indies ; cyder rich, highly flavoured and coloured, notwithstanding the paleness of the fruit.

3. The Golden Pippin is more generally known than the last, and I believe its liquor at market is generally second in price, and next to the stire apple.

4. The old Redstreak is yet in being ; fruit small, roundish, pale yellow, with faint red streaks ; flesh firm, full of juice, finely flavoured when ripe : little genuine red-streak cyder is now made, being generally mixed.

5. The Woodcock, a favourite old sort, now wearing out; fruit large; form oblong, with a long stalk feigned to resemble a woodcock's beak; colour like the red streak, with some dark blood red streaks on one side; flesh fine, fit for the table as for cyder; tree large, growing in the pear-tree manner.

6. The Must, an old favourite fruit, of which there are three varieties.

7. The Pauson, a middle-sized green apple.

8. The Royal Wilding, a large white apple.

9. The Dymmock Red, middle-sized red.

10. The Cockagee, large, greenish white, with an orange blush; well fleshed; and highly flavoured.

11. Russets of sorts, in good repute, particularly the Longney Russet.

12. &c. The Bromley, Foxwhelp, Red Crab, Queen-ing, all large red apples, are in good estimation for cyder.

Besides some of the above, Mr. Pomeroy has named, as Worcestershire cyder apples, the Blandrose, Rennets, Margills, Pearmain, &c.

Mr. Marshall says, the varieties of orchard fruit, in Herefordshire particularly, are without number; a very considerable proportion of the whole being kernel fruit, produced from trees raised from seed, and not grafted.

Pears—1. The Squash Pear, for perry is in much the highest esteem; it is an early fruit, and very tender; if it falls ripe from the tree, it will burst with the fall: the liquor is pale, well flavoured, and of a strong body, highly esteemed, and resembling Champagne both in colour and flavour, and is preferred to it by many; the price generally about four times that of common perry.

2. The

2. The Oldfield, is a favourite old pear, remarkable for the elegant flavour of its liquor.

3. The Barland is in great repute, for producing an agreeable liquor ; esteemed a specific in nephritic complaints.

4. The red pear affords a liquor of singular strength.

5, 6, &c. The Huffcap, the Jaynton, and the Sack, have usually been grafted as perry pears ; also the Linton, and a variety of others, besides a number of kernel fruits, that have never been grafted.

Respecting the wearing out of the old sorts, I believe it is irremediable, and what must of necessity naturally occur to all vegetables not raised from seed, in a long course of time. Dr. Darwin, in his *Phytologia*, has stated, and I think proved, that every bud, or shoot of a tree, is a distinct plant, and that a tree, taken individually, is of the nature of the polypus, and composed of a multitudinous assemblage of distinct plants, connected and nourished from the same stem and set of roots, but equally capable of existing separately, if placed in a situation where they can be supplied with their proper nutriment : that these buds and shoots, being produced, and reproduced, from the original shoot, and from each other, by solitary propagation, must partake of the nature of the original stock, beyond which it can never be improved ; and from the tendency of all material substances to decay, by successive production and reproduction, and being still, as it were, but a renewed part of the original stock, it must, in length of time, be exhausted of vigour and fertility.

But this decay, and wearing out, may, probably, be protracted to a great length of time by art and management ; conducive to which may be the choice of healthy and vigorous stocks to graft upon, and receive the scions

scions and shoots, and the choice of such shoots from the original variety, or as near it as may be, and not from trees that have been drawn forward, through many successive generations, from the original stock.

But the true system of preserving and improving varieties of fruit is, by raising young and vigorous plants, from the pippin seed, or kernel, of healthy individuals, whose productions are the most promising ; this being a sexual reproduction from the blossoms, formed from the most beautiful and perfect part of the plant, at the moment of its highest perfection, and being, as it were, the sport of nature in her most playful moments of highest exhilaration, a production may be expected, that will vary from, and sometimes exceed, the parent stock ; and when a superior variety is produced, may be continued for a great length of time, by the usual method of reproduction from grafting.

The same principle is applicable to potatoes, and other plants, which are generally cultivated by sets, shoots, or layers, instead of seeds.

For an orchard Mr. Marshall prefers a south-east aspect, screened to the north, though a blight is best partially avoided by having fruit in different aspects. Fruit-liquor is much affected in its flavour and qualities by the nature of the soil ; a loose soil on calcareous rock gives richness and high flavour to cyder ; a deep strong loam gives roughness and strength ; on the contrary, the squash pear gives the highest flavoured liquor from deep strong land ; the pear tree loves sloping ground (*Withering*), in such situations it will flourish in cold clay (*Marshall*).

In a mere orchard, half a chain is recommended as a proper distance for fruit trees every way, which is 40 upon an acre ; in grass land, or cultivated ground, a chain

chain length distant is recommended, which is ten upon an acre.

Season of Planting.—In a dry soil autumn is preferred; in a tenacious soil, the spring: the roots should be left on, as many and as long as possible; the young planted trees must be carefully protected from sheep, which, in a snow, would peel off the bark, and soon destroy the whole plantation.

At the end of two or three years, the stocks are sown off about six feet above ground, and cleft grafted; the grafts are protected by a kind of wicker-work basket, fastened round the stock; but he recommends grafting in the boughs.

He also recommends planting fruit trees in hop yards, as an advantageous practice: the trees, when young, do little injury to the hops; are highly improved by the hop cultivation; and, before their size becomes injurious, the ground is worn out for hops, and may be laid to grass, or cultivated.

The neglect of pruning fruit trees, which often occurs, is highly blameable, the suffering them to be ruined by mistletoe still more so; it is easily pulled out with hooks in frosty weather, and is worth more than the labour, as fodder for sheep, who are very fond of it, and to whom it is good and wholesome food.—Mr. Marshall conceives, that healthy trees, kept so by proper pruning, and free of mistletoe, are less liable to blight than neglected ones; he also observes, that young fruit trees can seldom be raised with success in old orchard grounds, and that pear trees being of much longer duration than apples, they ought not to be mixed in the same fruit ground.

Perry is the produce of pears alone;

Cyder is either produced from apples alone;

WORCESTERSHIRE.]

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Or,

Or, 2, from apples and pears jointly;

Or, 3, from the common wild crab, and the richer sweeter kinds of early pears; the two last species are used as family drink.

The early pears are fit for the mill in September; amongst them the squash pear; the stire apple is ready from Michaelmas to the middle of October; and the other sorts as they ripen: as they are often shaken down by the wind before ripe, and sometimes beaten down in that state, they are laid together in large heaps in the open air, until the ripest are beginning to decay, and then taken to the mill.

In grinding, it is necessary to good management, that the rind and the kernels, as well as the pulp, should be crushed or broken, as these are believed to give colour and flavour to the liquor; when ground, it is put into the press, which is worked by one man, who, with the girl or boy who drives the horse, and a man to put in fruit, and carry away the liquor as the reservoir under the press fills, make a set; and three hogsheads of perry, or two of cyder, is about their medium day's work; but working early and late five or six hogsheads are sometimes made in a day. The liquor is put into the cask immediately from the press, and set in the fermenting room; but no ferment, or additional substance, is made use of. Having remained some days in the first vessel, the liquor is drawn off the lees, and put into fresh casks, which operation is termed racking, and this is sometimes repeated.

The prices of orchard fruit and its produce are very fluctuating, varying with the quantity produced and the stock in hand; one night's frost in the spring has been known to raise the price of fruit liquor threefold from the preceding day.

In

In the great fit of 1784, common apples were sold at 1s. 6d. to 2s. per sack of four corn bushels; and in 1788 the same, but stire fruit, about four times that price.

Common cyder is frequently sold from the press for less than a guinea per hogshead of 110 gallons, and common perry as low as 15s. yet the superior kinds are seldom so low as four times that price; when once racked it is generally one fourth higher, and when fermented one half more than the first price, but in scarce seasons the prices are much higher. Stire cyder is worth, from the press, from 5l. to 15l. per hogshead, a price which, I believe, the finest wines are not worth in any country immediately from the press. Squash perry is worth, from the press, five guineas to twelve guineas per hogshead: at inns the price is seldom less than 1s. per bottle, and, as they profess to sell only the best sorts, sometimes 1s. 6d. and even 2s. per bottle.

Profusion in good Years.—In 1784, for want of casks, cisterns were formed in the ground to receive the liquor, but they did not answer; the liquor was spoilt: in Pershore, the juice is said to have run from the pear-hoards, in currents, into the common sewers.

The excise on cyder, which passes through the dealers' hands, is about threepence halfpenny the wine gallon.

The yield of liquor depends on the species of fruit, and the season. Pears yield more juice than apples, and some species of apples more than others; two hogsheads of pears will yield one of liquor, but some sorts of apples, as the Hagloe crab, and the stire apple, in very dry seasons, will require near three hogsheads of fruit to one of liquor. I was shewn single pear trees in Worcester-

shire, which in a hit have made two hogsheads and a half of perry, of 110 gallons each ; they must therefore have borne 550 gallons, or about 60 bushels level measure of fruit. Mr. Marshal says, I was shewn a pear tree from which two hogsheads of liquor were made this year ; and three hogsheads are said to have been made by one pear tree, and two hogsheads are said to have been by one apple tree, but these are rare instances ; one hogshead of cyder from a tree is reckoned a great produce.

Mr. Marshall says further ; I have been informed, by undoubted authority, that twenty hogsheads have been made from an acre of ground, in a close orchard ; and that there are several individuals this year, 1788, who will make between two and three hundred hogsheads, and some few who will make five hundred hogsheads of liquor each, including cyder, perry, and their own family drink ; but there are single orchards in Herefordshire of thirty to forty acres each.

It is from these large plantations that the markets are supplied ; farmers in general have little more than will supply their own houses : it is observable, however, that cottagers, who have orchards, have been known, in a plentiful year, to make eight or ten hogsheads for sale.

The produce of the four counties of Worcester, Gloucester, Hereford, and Monmouth, on a par of years, may be laid at thirty thousand hogsheads.—*Mr. Marshall.*

Notwithstanding this great produce, it has been disputed, whether, upon the whole, it be a good or an evil to the neighbourhood, under all circumstances : the damage done to the crops, by the drip and shade of the trees, is annual and certain ; a hit of fruit is most uncertain, and not expected oftener than every third year ; when the produce is abundant, the price is so low,

low, that it little more than pays for labour, carriage, and attention ; yet the profits of such year have to stand against the damages of three or four years, also against the cost of the plants, planting, grafting, and protecting the young tree, besides the mill-house and apparatus, and the cost and wear and tear of casks, as well as cellar room ; and Mr. Marshall says, the evils of a habit of drinking in a fruit year is the cause of much idleness, and in a dearth of fruit of an unnecessary waste of malt liquor.

Notwithstanding these objections, I cannot give up the idea of so beautiful and excellent a production as fruit, being both an advantage and a blessing to mankind, as well as an article beneficial to the country in a commercial view. If the trees are at proper distances, trained up to proper height, and pruned, the damage will be little ; if the liquor be prematurely sold at an under value, that is, for want of system, and the dealer gains the advantage instead of the grower, which is equally beneficial to society, the price will of course always be high enough to pay the amount of labour and interest of capital, or the liquor could not be made ; and the evils of drinking must be placed to the abuse, and not use, of the article, and may be corrected by regular management : something ought also to be placed to account, for the advantage of having always plenty of fruit for the family, as an article of food, made into reared pies ; cheese and beer at meals are but little necessary for the servants and children of the family.

When fruit trees become unproductive from age, they should be cut down, and not suffered to rot growing, and would thus pay all the damage they occasion, as timber and fuel.

As the better kinds of fruit liquors are now in sufficient demand at good prices, the way to make fruit trees profitable, is to cultivate the better kinds, and increase their number; and there is no doubt but a persevering industry might multiply and increase new varieties, equal to any formerly produced, and thus promote, not only individual profit, but national advantage, by increasing a produce that might, in some degree, supersede the importation of foreign wines.

The stire apple is now said to be propagated with tolerable success, by suckers from the roots, or rather by young wood pulled out of the crown of the tree; perhaps, some of the more valuable old fruits may be longer perpetuated by this means than by grafting. Mr. Marshal proposes layering the crown shoots, in tubs of earth elevated for that purpose.

He farther advises the fruit growers to relieve themselves from that bondage, which suffers dealers, from all quarters of the kingdom, to impose, in open convention, what prices they please for fruit liquor, in a plentiful year; but these objects of reform and improvement must originate with the land owner, and not with the tenant, who has only the use of the premises for a time uncertain. The present year, 1807, is a partial, but not a general, hit of fruit, supposed to be from one-half to two-thirds of a full crop, in some places a full hit, and in great profusion, and in other places partial failures; the apples, generally, a better crop than the pears; a very large quantity has been sent this season, in its natural fruit state, packed up in casks, along the canals to the northern counties.

In the hop grounds at Lower Areley, fruit trees are planted upon every fourth seven-foot ridge, at about eleven

eleven yards asunder in the row ; this is nearly one tree upon 100 square yards, or 48 upon an acre : this, Mr. Crane observes, assists the hop culture. The varieties of apples, called the Stedman and Knotts-kernel, are approved of for cyder apples, and the Barland and Linton pears are most common here as perry pears ; the Hampton-rough, a new perry pear, from a parish of that name where it was raised, is under trial, and is said to have produced some very good perry. The fruit trees are here planted out, ready grafted when small in the nursery ; and Mr. Crane observes, he can graft again when they begin to bear, if he does not like the sort, and thinks time is gained by planting ready grafted. I observe, in the Worcester newspaper, Mr. Biggs, nursery and seedsman, of the city of Worcester, often advertises new and approved varieties of fruit trees ready grafted for planting.

Mr. Smith, of Erdiston, in the Vale of the Teme, and about six miles from Tenbury, has the greatest breadth of orcharding I have seen in the county, belonging to any individual ; the extent of his fruit plantations is between 100 and 200 acres of different ages, and in different stages of growth, but a large proportion in full bearing, and this year being a pretty good hit, the fruit is in great profusion, enough to make some hundred hogsheads of fruit liquor ; he has constantly kept planting young fruit trees in succession, and the ground being cultivated for wheat, beans, or other crops, or grazed as pasture, the fruit trees occasion little or no waste of land : a number of hands were employed gathering fruit when I was there, October 1st, 1807. Mr. Smith raises fruit trees in his hop grounds, but rather sparingly ; the soil being a deep, rich, strong loam, the hops grow with great luxuri-

ance,

ance, and have room allowed in proportion ; they are here planted in nine-foot ridges, and fruit trees only in every fifth ridge, which is 15 yards from row to row, and they are near 14 yards asunder in the rows, each tree has therefore about 200 square yards of land, which is only 24 to an acre, this is the case in the hop grounds ; in the arable and pasture orchards, they are thicker on the ground, and nearer each other.

Mr. Smith has adopted a particular mode of fencing or guarding young fruit trees, when planted on exposed land ; he plants around them a tuft of well-grown hawthorn quicksets, without lopping, close to the tree ; the tops of the quicksets are tied round so as to guard the tree, and grow with its growth : upon my observing that the growth of these quicksets must rob the young fruit tree of part of its nutriment, his answer was, young fruit trees succeed no where better than in hedges, and this case is similar ; besides he has found, from long experience, the practice to answer well ; and, he observes, "nobody's trees bear better or sooner than his so guarded :" when the tree is sufficiently grown, the growing quicksets are taken away ; it is very probable, that the shelter and protection they have afforded the young fruit tree have more than made ample amends for sharing its nutriment from the earth ; and their roots also, most probably, strike in different directions in search of such nutriment.

A variety of the apple, termed Fox-whelp, is esteemed a good cyder apple here, but is an uncertain bearer, and is said to have generally borne better formerly.

One of Mr. Smith's labourers has been known to make 11 hogsheads of cyder, from the produce of three quarters of an acre of land in one year, and expects this season, 1807, to make five or six hogsheads from the same orchard.

CHAPTER X.

WOODS AND PLANTATIONS.

THE county of Worcester is well stored with the various kinds of timber ; and contains as much as is consistent with the rich quality of its soil, adapted to better purposes.

The hedge rows, through a large portion of the fertile parts of the county, are well stored with elm timber, the largest, finest, and, I believe, best in the kingdom, growing lengthy, fine, and large, and being generally sound and hearty, free from shakes and flaws ; large quantities of this quality are now growing in the neighbourhoods of Hartlebury, Ombersley, and elsewhere, though great quantities have been cut down and carried to Birmingham, and other inland towns, and by the Severn and canals to Liverpool and the sea-ports.

The elm timber here grows to a very large size ; there is now growing upon a small patch of waste land, near Dr. Nash's, of Bevere, an elm, whose trunk is nine or ten feet diameter, and containing some very long and bulky branches ; elm in hedge rows seems to occasion less damage to the adjoining land, than any other timber tree.

The county is interspersed, in various parts, with coppices of oak of different degrees of growth ; the

Throckmorton

Throckmorton estate contains many coppices of good oak timber.

In many other parts are as good oak and ash as the kingdom produces; but the extensive forests, so very considerable in early times, have almost disappeared, and the ground is much more properly occupied with corn and grass; Feckenham Forest has sunk entirely under the continued demands of the salt works at Droitwich; these, however, having been worked for years with coal, that demand ceases, and there remains plenty of hedge-row timber, particularly elm. Some woodlands are regularly cut in rotation, leaving young trees for timber at certain distances; the principal use peculiar to this county, to which the underwood is applied, is for hop-poles, and the cordwood is burnt into charcoal for the iron works.

Many of the noblemen and gentlemen's parks and pleasure grounds are well stocked with timber and plantations. At Croome, the Earl of Coventry's, is an exuberance of timber and plantations, in various stages of growth, disposed with such skill and taste, as to add picturesque beauty, and magnificent scenery, to a landscape not highly favoured by nature, unassisted by art. At Hagley, Lord Littleton's, is a profusion of timber and plantation, now verging very fast to maturity: Hagley was an early and very successful attempt at modern landscape gardening, laid out in the former part of the last century; in situation, variety, and aspect, nature had been propitious, and the timber has since been spared; amongst a variety of the better sorts, are oaks of great length and dimensions, fit for any use to which oak is applicable.

Many other of the noblemen's and gentlemen's seats are sheltered, and some of them almost hidden with timber

timber plantations ; many of the precipices upon the banks of the Severn, and sides of hills elsewhere, are well planted with fir, intermixed with other kinds of timber trees : at Tardebig, Lord Plymouth's plantations are very extensive, abounding with oaks in various stages of growth.

The vallies upon the rivers are pretty well stocked with poplar and willow, and particularly the course of the river Teme, which is often enveloped in willow plantations.

The Forest of Wire, near Bewdley, extends into Shropshire, but a considerable tract of it is in Worcestershire ; this is a great nursery for oak poles and underwood, which are cut out at stated periods, reserving timber trees at proper distances ; the oak poles, which are often shoots from old roots, are innumerable ; and very great numbers are cut down annually, and, after being stripped of their bark, are sold for making rails, hurdles, laths, &c. under the name of black poles.

Upon the Madresfield estate of Lord Beauchamp is a great profusion of timber, and some very capital fine oaks ; upon the Severn-end estate of Mr. Lechmere are many very fine elms and oaks ; I noticed an oak, containing by estimate 300 feet of timber, and 30 cwt. of bark ; an elm was lately there felled, containing 700 feet of sound timber ; it was ascertained to have been of about 140 years growth, and had grown five foot annual average.

CHAPTER XI.

WASTES.

THE waste lands of this county are not very considerable, and consist of high hilly grounds, or small commons or wastes, detached and dispersed over various parts of the county.

Of the high hilly grounds, the upper parts of Malvern Hill, are the most elevated ; these being rocky, are generally impracticable for cultivation, and must therefore ever remain sheep walk or plantation ; the upper parts of Bredon Hill, near Pershore, of Abberley, and Whitley Hills, and some of the unenclosed parts of Bromsgrove Lickey, are in the same predicament ; these are adapted for timber plantations.

The waste lands, according to Mr. Pomeroy, and which agrees with my estimate, do not exceed 20,000 acres, the greater part of which is capable of being converted into good arable land ; at present they are in a state of nature, overrun with furze, heath, and fern ; and summer a few sheep, of the short wool kind, but of an indifferent breed.

Mr. Oldacre says, the extent of waste lands is but trifling, and those are depastured with sheep, cows, or horses ; a certain number to what is called a yard land. One cow, or horse, is reckoned equal to three sheep,

sheep, and the farmer stocks with his proportion of such stock, as is most convenient to him; he further says, they are generally the poorest of the land, that would not pay much for tillage, but support flocks of sheep for folding on the common fields, which is an excellent manure for one crop: the commons, however, he admits, might be improved by fencing in; the poorest parts of them, he says, are often covered with furze, or thorns, which are useful in many respects. Few counties have less proportion of common or waste land than this, which might, however, be wholly much improved by enclosure, cultivation, and plantation.

Wire Forest, west of Bewdley, and in the north-west of the county, is of considerable extent, and penetrates into Shropshire; it is part wood land, and part open common land, of a cold indifferent quality; the wood land is well furnished with oak, from which are thinned immense quantities of poles, which, after stripping off the bark, are sold under the name of Black Poles.

Of the small, or detached commons, or waste land, Mitton Common, near Kidderminster, is a poor barren sand; Hartlebury and Lynall Commons, of some hundred acres, would make good arable land in the turnip and barley culture; Oldfield, near Ombersley, is now good sheep land and plantation; Burley and Astley Commons, near Stourport, are sound land, adapted for turnips and barley; besides which, are many other commons in various parts of the county, which might be improved into good arable and pasture land, by enclosure and cultivation.

CHAP. XII.

IMPROVEMENTS

SECT. I.—DRAINING.

THIS, as in other counties, is considered as a first-rate improvement, and is not, in enclosed lands; neglected; this county, however, has less occasion for this improvement than many others, as containing naturally a smaller proportion of springy or boggy land.

Various experiments have been made at Ewell Grange, the seat of the Earl of Plymouth, and in that neighbourhood, by boring hollow drains after Elkington's method.

The drain to be bored in, is thus made:—The trench is begun almost level with the surface, in that part from which the water can be most certainly and conveniently carried off. In determining its direction, great attention is paid to the situation of the bogs, and to the rising grounds from which they (the bogs) are likely to proceed; the trench is then continued on, varying from a dead level only so much as may be of service in promoting the discharge of the water; when sufficiently advanced into the piece to be drained, an attempt by boring is made, to discover the spring; if successful, and the water is judged to issue in a proper quantity, this part of the business is completed; otherwise the trench (or its necessary branches) is continued on, and the boring repeated at intervals, till it succeeds.

succeeds. The drain is formed of brick made for the purpose, called gutter brick. The brick, the pebbles, and the faggots, which form the drains, at the bottom of the trenches in which they are used, are covered in the usual manner with earth. Some of the old under ground drains are also made with brick; others with small pebble stones, where they are in plenty; and some, with small faggots of brushwood.

Draining is not much practised in common fields, but more attended to in enclosures; in clay soils turf is used; in others, wood or stones, which is most convenient, the latter is most lasting.—*Mr. Oldacre.*

Mr. Darke observes, of the lands in Bredon, in common fields, little or no attention is paid to drains. The Severn is our main drain; the Avon, the first conductor to it; our brooks and ditches leading to the Avon, change their owners as the lands vary: consequently, the cleansing is not regularly attended to. Much draining has been done in enclosed fields; some in the open fields. We prefer the stone-drain; what was done formerly with wood, is entirely worn out, and in gravelly soil, it goes very soon indeed.

The most skilful drainer I know in Worcestershire, is the present Earl of Coventry: his part of the county was a morass not half a century back, and is, at this present time (though formerly a moorish soil) perfectly dry, sound for sheep, and other cattle. He has but few under drains. His principal drains are open, formed thus:



turfed

turfed to the bottom, so that cattle can graze without any loss of herbage; no water ever stands; and Croome is now noted for its dryness, as well as being well kept; and although the house is surrounded with 1,400 acres, under his own inspection, you do not see a tree, bush, or thistle, growing upon it, undesigned or out of place. It may very justly be stiled a pattern farm to this kingdom, from its well-formed plantations, and its judicious and extensive drains. He has a beautiful breed of the Holderness, or Yorkshire cattle.

On a farm called the Sink, lately purchased and taken in hand by A. Lechmere, Esq. draining is now carrying on with great spirit. I was shewn one of the main outlets covered in, and communicating with other drains, in which borings have been made where thought necessary; this main outlet produces a constant perennial stream, and has done so in the driest season ever since its construction: tiles are used in forming the drain, twelve inches long, about three inches and a half wide, and three inches and a half deep.

Mr. Carpenter shewed me a tract of land, of upwards of 60 acres, formerly a peat bog, which he had drained by Mr. Elkington's method, and converted into good meadow land; it now forms part of Chadwick Manor Farm, on the west side of Bromsgrove Lickey, part being old, and part new, enclosure; the principal outlet from which forms a considerable perennial stream, issuing out from it and falling into the brook below; the following is his own account of it:

"For the speedy improvement of this land, I am indebted to Mr. Elkington, and must acknowledge the benefit I received from his advice; he came to take a survey of the bog intended to be drained, when I pressed

pressed him to undertake the cure, but he, having so much business at that time under hand, was obliged to decline my work, along with some others.

" I afterwards applied to Mr. Masters, a neighbour of Mr. Elkington's, who had, for some time, followed his plan of draining ; I must likewise do justice to Mr. Masters, by observing, he conducted and completed the business to my entire satisfaction ; and the whole was performed by a single drain, as the land falls gradually from the upper side towards a brook opposite.

" Mr. Masters employed six, and sometimes seven or eight good labourers, and set them to work at the lower end next the brook ; beginning shallow at first, to secure a proper fall for the water to empty itself into the brook, till he came sufficiently into the bog ; then cutting a trench four feet wide, and from eight to nine feet deep, carried it on from end to end, near three parts in four distant from the upper side, and about a fourth part distant from the brook ; the earth was thrown out chiefly on one side, but occasionally on both.

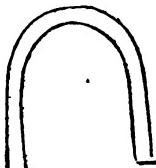
" While this work was carried forwards, the borer was employed, being worked by two, three, or four men, according to the hardness of the separate layers of earth, mixed with stone or gravel, considerably below the bog : this is a laborious business, the borer being forced, by dint of labour and strength, from seven to nine feet below the bottom of the drain ; and this was performed about every four yards from the beginning to the end.

" The borer thus used always, produced some water ; but in many places the water issued with such force, that a staff, when dropped its whole length a yard or more into the cavity, would almost immediately be sent to the surface, while this work was going on.

"The next step taken, was, to follow up the work so as to secure a course for the water to empty itself into the brook; this was done by stones got at an adjacent quarry, cut on purpose, about eighteen inches long, and eight in depth, placed on each side the drain six inches apart; then a thin turf put on each outside of the stones, to prevent the soil from getting between the joints; afterwards a covering stone, eighteen inches long, and eight wide; over these turf, gorse, or rushes; heath (*erica*), is, I believe, still better; and lastly, the drains were filled up with the soil which had been thrown out; this is done in the best manner by two men, one to shovel the soil into the drain, and the other, at the same time, to level and tread it well, to prevent any wet from injuring the drain."—See Plate IV. Fig. 1.

I viewed the above-described drainage in August, 1807, but then forgetting to make a sketch of the premises, must refer the reader to Plate IV. to convey the general idea. A. the lower corner of the premises; A. B. the outlet, the ground rising to B. eight or nine feet above the level of the brook at A.; B. C. the drain, with borings, in a direction rising a little from B. to clear itself: this drain, by its depth and borings, drains the land above, and by intercepting the springs, prevents their breaking out below.

Upon Brant Hall estate, Worley Wiggorn, Mr. Richard Miller has executed hollow drains with great spirit where wanted, in almost every field; here draining tiles are used to form the opening; they are made in a semi-circular, or rather semi-elliptical form, thus:



being four inches wide, three inches deep, one foot in length, and one inch in thickness; in hard ground they are placed on the bottom of the drain; in soft, on tile pieces; and where one is thought insufficient, two together are used, forming a pipe of four inches wide by six deep, or laid beside each other, forming two drains; this method has here answered extremely well, by rendering sound and wholesome a farm formerly cold and springy, and which, from being sterile and unproductive, now yields good crops of grain, or excellent pasture for sheep and cattle; the tiles cost 90s. per thousand at the kiln, which, when laid single, amount to 15d. per rod of eight yards, or, if laid double, to 2s. 6d. the labour 10d. for every such rod, and beer, which makes it equal to 1s. the depth of the work three to four feet; they are secured by turf and heath, &c., laid upon the tiles before the drain is filled up. Mr. Miller often borrows in the bottom of his drains: land should be drained before Ketting, and, indeed, before any other improvement.

SECT. II.—PARING AND BURNING.

This, Mr. Oldacre says, has not been much practised here, as there are but few old lands to break up, and there are but few roots in new turf to make ashes. If a farmer has a piece of strong turf, he generally plants it with beans, or sows flax at one ploughing with a turf plough, by which, the turf being buried under a clean furrow of mould, by the next year is sufficiently meliorated; and this practice is preferred to paring and burning.

But Mr. Carpenter relates, that paring and burning

has been a good deal practiced in the improvement of the waste lands of Bromsgrove Lickey, and in that neighbourhood. Part of the drained bog mentioned in the last article, was, he says, pared and burnt, and planted with potatoes ; the ashes being spread regularly on the surface, the land was ploughed in about twelve furrow ridges ; for, he says, “ it would not do to plant in the way I prefer, owing to its being so very tough from rushes, and other hard roots : after ploughing, the furrows were hacked and levelled with heavy hoes, then planted across the ridges in rows, and owing to the large quantity of ashes, produced an abundant crop.”

The ploughing of bog land with potatoes, after draining, and paring and burning, is, I believe, the best rule that can be adopted ; the ashes upon the fresh soil are peculiarly adapted to forcing a full crop of potatoes, and the crop being properly hoed and cleaned, will leave the land in a good state of amelioration ; the next year after the potatoes, this land produced a very strong crop of oats ; the succeeding year as good oats as the first ; it has been since laid down with seeds after a clean fallow, which succeeded well : land of this sort, consisting of a deep peat, may be pared and burned at any time, and will produce good crops, without any other manure but the ashes produced from its surface ; and that without danger of being exhausted ; and, like watered meadows, will produce manure for other parts of the farm, without injury to itself.

The waste lands in this neighbourhood, Mr. Carpenter says, were best reclaimed thus : 1. pare and burn for oats, potatoes, or rye ; 2. lime, four to six tons per acre, for turnips;

turnips; 3. autumn wheat, spring wheat, or barley, with seeds, then pasture for two or three years: the paring and burning here cost from 2l. 2s. to 2l. 10s. per acre, with three quarts of good beer per day to each labourer; but the ground was very much covered with gorse, and very stony likewise, which rendered the work difficult, and had been thought impracticable, which accounts for the high price given; the ashes also cost 1s. 6d. per acre the spreading. Mr. C. says, "I was at considerable loss in one part, by not spreading the ashes so soon as they ought to have been, being what is termed in a dead state, and the crops suffered accordingly; but I afterwards took care to have them spread in a live state, with different kinds of grain, &c. as wheat, rye, turnips, and potatoes, according to the season, and as the ashes were ready, when the whole produced good crops; but, on the average, the potatoes answered best; I sold, at one time, nearly 40 acres of potatoes to different persons, from new enclosed waste land, managed as above, at from eight guineas to twelve guineas an acre, those who bought them gathering the crop, and carrying them off the ground; rye sold at ten guineas, and oats at 6l. per acre. I wished to bring this land to sheep pasture as soon as possible, but the seeds sown on these crops in the spring failed; I was, therefore, obliged to turnip fallow with about six tons of lime per acre, drawn twelve miles; the turnips and barley following were good, and the seeds then succeeded perfectly well, which I attribute to the lime, which answered much better on this fresh soil, by many times over, than on old tilled land, though used in the same quantity.

SECT. III.—MANURING.

Dr. Nash says, manure pays better put on green-sward than on tillage, but the land must first be drained and made sound.

The farm yard dung is used on wheat fallow, or for turnips, or potatoes, or sometimes laid on grass land : where hops are grown, a good proportion of dung is sometimes laid upon the hop ground, which Dr. Nash thinks one objection to the culture of that plant ; which objection may be, in some degree, removed by the use of lime, or a compost of soil and lime; with one-third part dung, which is an excellent dressing for hop ground, and will answer the purpose better than the constant use of dung only ; also, if the occupier were obliged to purchase elsewhere, all the dung used in his hop grounds, the objection respecting robbing the other part of the farm, would be entirely removed.

In the north and north-east of the county, upon the gravelly and sandy soils, considerable quantities of lime are used for manure, brought from Dudley, and its neighbourhood, by the canals, or by land carriage ; this lime has a good effect in biuding the light blowing sands, and rendering them less liable to be acted upon by the wind ; it is also found excellent in promoting the growth of grass seeds, if laid on with the crop, with which such seeds are sown.

Mr. Pomeroy has named horn shavings, leather shreds, ashes, soot, and offal salt, from the works at Droitwich, as being likewise used ; also soil from ditches, and marl mixed into a compost by turning them together ; he has further expatiated upon salt, and stated its being used as manure under the tax,

Mr.

Mr. Carpenter also says, common salt is an excellent manure, when only slightly mixed with mud, or soil; he relates an experiment of 10 acres of rough old pasture, covered with rushes, which, by dressing with a compost of soil, mud, and offal salt, after close mowing down the rushes, produced, the next year, a matting of white clover, cow grass, and yellow vetchling, and effected a very great improvement in a short space of time.

But these accounts are rather at variance with other very respectable authorities; Dr. Nash believes, from experience, (and he occupies a respectable farm,) that Droitwich salt is neither a manure in itself, nor capable of exciting any vegetative principle in the earth; that it produces bad effects on ploughed land, by increasing its dryness in hot weather, and by making it greasy, and what the farmers call raw in damp weather, and that its only use in heaps of compost is to destroy weeds, and their seeds.

Marl is used, in some instances, upon the sandy and gravelly soils in the north and north-east of the county, but the generality of the land of this county has enough of the marly principle in it from nature.

Where the distance from great towns is too far to get manure from them, it is not much a practice to sell hay, or straw, but great attention is paid to make the most of what the farm produces in dungbills, which is conveyed annually on the land. Mr. Oldacre, Vale of Evesham; he says lime is too dear to be commonly used.

Nature has been bountiful to us; we often put our manure immediately on the land from the fold yard; but when we spare it from the arable to the pasture, we turn it once, and when we clean ditches and ponds

mix

mix soil with it; we use no lime, it lies too far distant.
—*Mr. Darke, Bredon.*

Mr. Carpenter recommends to fold a large flock of sheep every night in the straw yard; in this case, there should be two fold yards, or one divided in the middle, that the cattle may not injure the sheep; the sheep must be penned every other night in the yard, the cattle are foddered in the preceding day, and the cribs emptied; and the contents spread about for the sheep, who will have the advantage of picking amongst the straw, and laying warm and comfortable, and the manure will be improved: in very severe weather, a little hay should be given the sheep in the cribs and racks.

Mr. C. says, all muck in a raw state, should be turned over to ferment before it be carried on the land; and further, in farms where the roads are bad, and manure scarce, it would be an advantage to feed a number of pigs to eat all the beans, pease, and refuse grain of the farm; and should the pigs, when fat, only barely pay for the food which they consume, great advantage would arise from the addition of manure they make.

Pigeon and fowls dung should be preserved in a dry state, and sown as a top dressing on any land you think proper; soot is also an excellent top dressing either for grain or grass, especially on cool land. Mr. Knight has found it equally beneficial on light land.

The mud of pools, ponds, and pits, is very serviceable to all kinds of land, and is improved by mixing with lime; horn shavings, malt dust, and woollen rags, are also recommended as manure.

Wood, turf, and peat ashes, contain rich and fertile salts, and soap boilers' ashes, are very enriching to land, but can seldom be procured in any great quantity; ashes kept in a dry state, previous to being spread on land,

land, are much superior to those in a wet or damp condition, when used as a top dressing.

Mr. C. thinks a good coating of sand, would double the value of some clay soils, but this does not seem to have been proved by experiment : he says, it not only ameliorates it, but absorbs its wet and unkindly qualities.

Manuring of Waste Land.—Some well meaning persons have contended, that waste land can only be improved by the surplus of manure from land already in tillage, but this idea is erroneous ; waste land ought to be improved from its own resources, or from foreign aids, as paring and burning, lime and marl, with clean fallowing, turnips, clover, sheep, and other live stock, with the manure they make from the produce of the land in question, without robbing the old enclosed lands.

Pigeons Dung.—Mr. C. says, he has known, upon a farm of 200 acres, enough of this collected, in the space of twelve months, to manure ten acres of land ; the method was to strew malt dust over the floor every time the dove-house was cleaned ; and to keep this compost of malt dust, saturated with pigeons dung, carefully in a dry place till used ; before sowing it on the land, it must be well mixed by turning it over ; this is an excellent top dressing for grass, turnip, or other land ; a little will do more service than a common dressing of other manure.

Town Manure.—Upon Brant-hall Farm, in this county, six miles from Birmingham, Mr. Richard Miller finds the manure from that town to answer well, both for grass land, and every kind of crop ; he employs a six-inch wheel waggon and six stout horses, to draw this manure at all leisure times ; finds it excellent
for

for the Swedish turnip, after common turnips, eaten mostly on the ground by sheep; draws five and sometimes six tons at a load; and several hundred tons in a season, or in the whole year. The price of good stable manure in Birmingham, seven shillings per ton: one of his loads thus costs from 35s. to two guineas, besides the carriage.

Mr. Knight, upon his farm of Lea Castle, Wolverley, manures with great spirit, but principally for turnips; he buys all the soot he can get, at Kidderminster, and other towns within his reach, the price 8d. per bushel, the soot-merchant sowing it on the ground; a waggon will hold with tilted side-boards, and a team will draw, 200 bushels; a load thus costs 6l. 18s. 4d.; but it is sown upon four acres, 50 bushels to an acre, the expense of sooting an acre is, therefore, only 1l. 18s. 4d. It is generally sown upon the turnip fallow, and harrowed in before the last ploughing, but has been found to answer in every way, and as well as any, to top dress mown grass land.

Lime is also very freely used for turnips, about four tons per acre, besides drawing it from a canal to the land, the price is 14s. 6d. per ton; this is 2l. 18d. per acre, besides carriage and spreading.

The remaining source of manure in this county, besides those before-named, is sheep folding; this is regularly practised in the open fields upon the fallows, but rarely in the enclosed lands: Mr. Knight has, however, made several experiments on folding sheep, which he means to continue.—See *Folding*, under the Article, *SHEEP*.

Mr. C. says, marl is an excellent change of manure for the kitchen garden, where, if you would have the sweetest and best kind of garden stuff, it is not proper to,

to load your garden, year after year, with muck; which will give the produce a rank taste; to prevent which use marl, fresh soil, lime, &c, alternately, and dung more sparingly.

Mr. Lechmere, Dec. 1807, is top-dressing his grazing pastures at the Ryd, with rich manure, made by his stall-feeding cattle, fed with hay and oil cake: as little ploughing is done here, the dung is not over proportioned with straw, and having undergone sufficient fermentation, must be highly fertilizing to the land, and increase its produce of grass, as well as improve its quality.

4. WEEDING.

The drill husbandry being a good deal practised in this country, gives a good opportunity, between the rows of grain, of cutting up weeds by the root without injuring the grain, which is one of the advantages of this practice; in broadcast sowing they are generally only cut above ground, and thus only weakened, or partially destroyed.

Every good farmer will cut off, or root up, the docks, thistles, and other luxuriant weeds, which infest his pasture land, and this should always be done before their seeds are perfected, as thereby a great increase of these noxious plants may probably be prevented.

Examined the weeds in a pea-stubble near Evesham, and found corn chamomile (*anthemis arvensis*), bindweed (*convolvulus arvensis*), chickweed (*alsine media*), groundsel (*senecio vulgaris*), bearbind (*polygonum convolvulus*), and common thistle (*serratula arvensis*). Mr.
Marshall

Marshall says, the following are also common : ivy chickweed (*veronica hedere folia*), hairough, or corn goosegrass (*galiuni spurium*), shepherd's purse (*thlaspi bursa pastoris*), mouse ear (*cerastium vulgatum*), fumitory (*fumaria officinalis*), chadlock (*sinapis arvensis*), goose foot (*chenopodium viride*), marigold (*chrysanthemum segatum*), poppy (*papaver rhoes*), wild oat (*avena fatua*), corn horse-tail (*equisatum arvensis*), knap weed (*scabiosa arvensis*), besides the couch grasses, and many others less common.

The original design, and true use, of summer fallows was, and is, to destroy weeds, previous to sowing the intended crop ; and thus, by preventing their growth with and in the crop, to apply the whole force of the land to that alone ; but the intention is frustrated, and the effect defeated, unless the fallow be well managed ; ploughing in dry weather has a tendency to destroy root weeds, as couch grasses, thistles, horse-tail, colt foot, &c. ; but the ground should afterwards be harrowed down fine, and left for showers to force the vegetation of the seedling weeds, which include most of the other species, and when they are well vegetated, they should be well ploughed in, and the ground again harrowed to vegetate those seeds which were before too deep, as well as to bring the root weeds to the surface, to promote their destruction by exposure to the sun and air ; a fallow well managed, by these operations being repeatedly and well-timed during the summer, will probably have little occasion for weeding during the crop, unless the land has been long fouled by weeds shedding their seeds.

It is to this latter circumstance, that the innumerable weeds in cultivated ground are principally owing ; for being hardy natives their seeds will vegetate, after being

ing buried for years, upon being exposed to air and moisture, by ploughing and pulverization of the soil ; the prevention, therefore, of weeds shedding their seeds, is of great consequence to agriculture, for one years seeding shall make seven years weeding.

Many of the common corn weeds, as thistles, goundsell, sow-thistle, colt foot, and many others, have their seeds furnished with feathers or wings, by which they fly for miles all over the country with the wind, and grow wherever they alight ; and I saw many, and some most shameful instances, where these weeds were suffered in great numbers to perfect and shed their seeds, and thus scatter them over the whole country, from fallows, hedges, road-sides, and particularly from heaps of soil intended for compost and manure ; this neglect ought to be considered as a public nuisance, and made indictable at common law ; and it would be a good regulation, if the constables, who, by ancient custom, are obliged to make presentments, and who seldom have any thing to present, were obliged upon oath to prevent such offences at the Quarter Sessions, and the offenders to be punished by a suitable fine.

Mr. Marshall, in his minutes on the Vale of Evesham, says, it is a common practice there to hoe wheat sown broadcast ; as I was not there in the weeding season, this escaped my observation, and I therefore beg leave to quote from him.—“ The first hoeing is begun in April, and ought to be finished before the plants begin to tiller, or put out their shoots ; the sooner the second hoeing succeeds the first, the less difficulty there is in doing it ; width of the hoe from three to five inches, from that of the turnip hoe, with the corners rounded off ; the operation performed by women and children ; the price half a-crown an acre for the first hoeing, or

sometimes

sometimes 3s.: a woman, under kindly circumstances, will hoe half an acre a day; the second hoeing is frequently more tedious than the first, by reason of the crop hiding the ground, and frequently passes over in a hand-weeding only."

5. WATERING.

The extensive range of meadows on the Severn, and other rivers, are watered occasionally by the inundation from those rivers, and the land thus kept in high condition; though not without some inconvenience, from the operation not being always timed, suitably to the leisure or convenience of the occupier.

Dr. Nash relates an account of 300 acres of land, near Chaddersley Corbett, watered by Bellbroughton brook, and, being barren sand, improved from 5s. to 50s. per acre, annual value, and that this improvement was made 100 years ago: this may serve to shew, that the improvement of land by watering is not a modern practice or discovery.—See Mr. TURNER's Account.

Mr. Darke of Bredon remarks—In one instance only the water of the fold-yard is carried over a large field, evidently to great advantage. Our meadows are wonderfully enriched, and at the same time too frequently damaged, by the overflowing of the river Avon, which extends itself near six miles through this parish. We, on the spot, conceive our meadows to be the first flooded, and to lie the longest under water, of any in this kingdom. Severn is our natural drain; but we want in wet seasons, more sluices, or gates, or wears (which might be easily made), to conduct our overflow of water

water from Avon to Severn ; could we be unanimous in the method of effecting it, the expense would be easy : nothing would improve this part of our country, or render us such essential service. Now I am noticing meadows, if ever an enclosure takes place, the meadows should be lotted, to lay property together, but not divided by fences ;

And Mr. Oldacre—Here are about 80 acres of land watered, belonging to George Perrott, Esq. but I do not know of much land capable of that improvement.

MR. TURNER'S ACCOUNT OF THE WATER MEADOWS ON
THE FOLEY ESTATE, BEING THE SUBSTANCE OF A
LETTER TO MR. POMEROY.

The plan of watering the land in this neighbourhood, belonging to the Foley family, is shortly as follows:—It is in the first place necessary to observe, that all the mills on the brook, or stream of water, as soon as it enters on their property, until it unites with the river Stour, for near three miles, belong to them, of course they have the controul of the water. At the upper end of the stream, are three or four water-courses, made for several miles upon a level to the different farms that are watered, and the old stream divided in a manner proportioned to the quantity of land each course is intended to water. The farms that receive this valuable acquisition are eight or nine, and the quantity of land watered upon the whole of them, is between three and four hundred acres. The quality of the soil, in general, is a very light sand, and many parts of it mixed with gravel: by the division of

of the stream as above, each farm has its portion of water repeated from two days to a week, every three weeks throughout the year ; and in order to prevent the least dispute between the tenants, respecting the distribution of the water, a person is appointed to turn it from one person's land to the next in turn, at certain stated times, fixed for this purpose.

The farmer then takes to the management of it, and floods such part of his lands as is generally prepared to receive it. There are very few of them that mow the whole of the land they water, but mow and graze it alternately, in such a manner that they use the water at all seasons of the year in their turn. A very considerable quantity of land in this neighbourhood, is well situated to receive this improvement, if the stream was sufficient for the purpose : besides the number of acres already mentioned, the greater part of which was formerly a very poor arable land, and not worth more than 5s. an acre. The industrious farmers are very attentive to the use of the water ; all the gutters are cut for floating, with the use of a water-level, and the more numerous the gutters are, the greater quantity of grass the land produces. In some situations, with the use of little stop-gates, the gutters are cut deep enough to drain the land they are made to float ; this circumstance, where the land requires it, is worthy of great attention. The whole plan of irrigation, where practised, (and very few farms indeed will admit of it in some degree), is beyond a doubt the first, and greatest improvement, at the least expense, ever discovered. This is the watering referred to by Dr. Nash, before-mentioned.

Mr. Carpenter highly approves of the improvement of land by watering ; but says, “ it requires attention to

to carry it to the necessary perfection ; it is let at double and treble the price of land of equal quality, incapable of watering."

He has seen watered meadows, with proof spots not watered, on purpose to shew the difference. In the month of April, the watered land was good pasture for sheep, or cattle ; on the parts not watered the land was barren, without any spring shoot of grass.

As soon as a meadow is cleared of the hay, there should be plenty of live stock turned in, to bite close what little may be left by the scythe ; and that no time may be lost for promoting the growth of grass, the floating gutters should be pared and cleaned as soon as possible, and the land floated so soon as water can be had, which will force an early and plentiful aftermath ; the same rule is to be observed in the spring of the year, so soon as the land is saved for the ensuing hay crop.

In general I have found the space of three days sufficient for the water to flow on the same spot at one time ; but light dry soils will bear much more watering than wet and strong ones ; but on this point, and various others, as the situation, the quantity of water at command, and other local circumstances, must depend the means to be used to promote the greatest advantage.

If the water be neglected, and allowed to float too much in one place, the grass will be coarse and rotten at the bottom when mown, whilst other places may have too little crop for want of water.

It is much to be regretted, that the improvement by watering should be neglected, on any land capable of receiving that benefit ; but in all cases, draining, if

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P

wanted,

wanted, should precede watering, otherwise the grass, or hay, cannot be expected to be of the best quality.

A number of useless small corn mills is a great hindrance to the improvement of land by watering. I seldom find that mills erected on large streams prove much obstruction to watering meadows; on such large streams mills are proper, and sufficient to perform the business in most countries; or if not, steam or wind-mills ought to be erected, which might well answer the purpose, and the water might then be applied to a much better use. I could easily prove, in many instances, that these small mills do more injury by depriving the land of the water, than they are worth, and five times more than any service they render the public, or their owners; they also often pound up the water so as to prevent many meadows from being under drained, to the great injury of the land.

A farther loss to the land occasioned by these small mills, is their retaining the mud, and other rich soil, in their mill ponds, which is washed by the heavy rains from the adjacent countries. I have known a ten acre meadow much benefited by the mud produced from a mill pond; this work, though it saved the miller the expense and trouble of doing it himself, he does not choose to allow being done, without a premium; it is the work of one day in the year, performed by six or seven men with scrapers, to mix the mud with the stream, and this thick water floats the meadow over during the time allowed.

Respecting grazing water meadows with sheep, the best opinion is, that there is no danger of their taking the rot after the first autumnal frost, till it is time to re-

serve

serve the land for mowing, which should be in the month of April, for watered meadows, when the fences should be well repaired, and all stock taken out; but the closer it is then grazed down the better, as the floating gutters should be previously cleansed, and the land receive the benefit of watering, if possible, immediately upon being shut up; meadows, so managed, may be expected to yield hay in great plenty, in defiance of drought, and when hay is in the greatest demand, here the dung cart is not wanted, but the produce assists the dunghill, for the benefit of the land kept in tillage.

Upon Brant Hall estate, Mr. Richard Miller regularly waters about 30 acres, upon the Catch water system; he happens to be luckily assisted by a reservoir ready formed to his hand, intended for a fish-pond and watering place for the use of the farm, and containing about half an acre; this piece of water is constantly supplied from what was formerly a bog above it of about two acres, but now being well drained is planted annually with cabbages, but continues to afford an equal, if not an increased, supply of water; the bog and reservoir being situated in a valley, also receive a considerable supply of water from land floods, and the melting of snows. The pond is occasionally drawn down at pleasure, and the water distributed over the land below; the mud is, at times, stirred up by means of scrapers, and sometimes a pair of harrows are introduced and drawn to and fro by men with long ropes; by these means, 30 acres of grass land is maintained, in a good mowing state, with little or no assistance from the dung cart.—See Plate V.

Explanation.—*P.* the pond, or reservoir; *s.* the

stream, or rill, which supplies it from the drained bog above; *A.* the meadow flood gate, to turn the water along either carrier, another being in the pond above to stop the water when not used; *c. c.* main carriers, or floating gutters; *b. b. b. &c.* are secondary floating gutters, communicating with those above by cross gutters, which can be shut up by stops, or with clods at pleasure.

Trunks and paddles are laid in at the head of the cross gutters, where they join the main carriers *c. c.* by means of which, the water can either be driven farther along such main carriers, or let down into the floating gutters below at pleasure.

CHAPTER XIII.

EMBANKMENTS.

THESE, as connected with agriculture, are, at present, rather unimportant in this county. Some slight attempts have been partially made in the lower parts of the county near Upton, to keep off the minor floods of the Severn; but these not being upon a general system have no great effect; and, indeed, I suppose it difficult, and perhaps not possible, to keep off such a water as the Severn, which, at times, after heavy rains, or the melting of deep snows upon the mountains of Wales, spreads over the vale, from half a mile to a mile in breadth, and to a considerable depth, as sketched, Plate IV. Fig. 2.

These embankments are nothing more than earth covered with turf, without any particular puddle in the construction, being only reached upon an overflow of the river. Mr. Marshall, in his Minutes on the Vale of Severn, says, "This is not a public work, nor is it general, the meadows being, in many places, still left open, the intention of it is merely to secure the grass from being sitted, and the hay from being swept away by summer floods; the banks being low, not more,

perhaps, than two or three feet high, the winter floods surmount them ; or if raised higher, the water, at that season, is, I understand, sometimes let into the meadows, by sluices opened for that purpose, so that the meadows still receive a benefit from the floods." In some places, where the channel of the river is near one side of the valley, an embankment is raised on one side only.

CHAPTER XIV.

LIVE STOCK

SECT. I.—CATTLE.

THIS county has no particular breed of cattle, and Dr. Nash observes, that the land is too good for breeding, as it certainly is, unless for the breeding of prime stock; the cattle when wanted, are therefore bought in, and the sorts most esteemed are the Hereford and long horn, which latter are procured at the fairs of Staffordshire and Shropshire.

Observation.—Worcestershire, on its fine land, has little occasion for breeding cattle, surrounded as it is by breeding countries; Herefordshire and Shropshire on its borders, and South Wales at hand, all produce plenty of capital stock to spare, and the produce of Staffordshire and Yorkshire are brought in by jobbers.

Mr. Pomeroy says, “The bullocks, on the western side, are chiefly of the Herefordshire breed; Staffordshire furnishes some, and indeed, all the adjoining counties. The Earl of Coventry has introduced the Holderness breed, with great success; his lordship’s tenant, at Mitton, has some Devonshire, but they are not of the true breed of that county:” he further says, “those that have been bred in the county, are a mixed breed, without any particular improvement in view; some

some few have now turned their attention this way, and the experiments are in judicious hands, such as will spare neither expense nor care in perfecting them."

At Croome, Lord Coventry has cultivated two breeds of cattle: the Holderness, as above-named; and the Alderney; the Holderness are very large heavy cattle, the Alderney small and light boned: at a sale of some of these cattle, which were to be spared, by auction, October 3, 1805, the Alderney sold much the dearest in proportion to their weight; a small Alderney cow in calf sold for 20l.; an Holderness of about three times the weight with a calf, sold for 27l.

Mr. Darke says, "A part of our pastures is used in dairies; some of these are employed in making butter for the Birmingham market, and a skim cheese, they call two meals or seconds; these sell for 8s. per cwt. less than one meal, or best making; the dairies that make best cheese depend entirely upon it and make no butter; where they make the skim cheese, the land is deemed too rich for one meal, as it causes it to heave, which gives it a strong rank flavour."

Some of the finest pastures at Mitton and Bredon, are employed in feeding oxen of the best Herefordshire breed, and some of the Devonshire sort for the London market.—See FEEDING, Chap. VIII. and in this Chap. article FEEDING.

SECT. II.—SHEEP.

The sheep of this county, like the cattle, are of no particular breed, except the common or waste land sheep; these, both upon Malvern, the Lickey, and the other

other wastes, are grey faced, with grey legs, without horns, and with clothing wool; and are, doubtless, from the same origin with the Cannock Heath, and Sutton Coldfield sheep of Staffordshire, and the Southdown of Sussex; this is one of the most extensive waste land breeds in the kingdom, but has only been improved by attention, in the case of the Southdowns; those in Staffordshire and Worcestershire, remaining nearly in their natural state; other different sorts are preferred by farmers who have no common right. Dr. Nash, and many others, approve of the Ross, or Ryeland ewe, crossed with a Leicester ram, and this cross forms a thick compact breed, healthy, and of good carcass. In the north and east of the county are many flocks of the Leicester and Cotswold sorts, the owners of which, find their account in crossing with new Leicester rams. A considerable number of sheep have, also, been brought in from Weyhill, and other fairs, of the Somersetshire, Wiltshire, and Dorsetshire, breeds; these are generally kept as annual stock, and after fatting an early lamb and shearing, are put into some of the rich meadow and pasture land, and made up for the butcher.

Mr. Pomeroy has observed, there is a breed peculiar to the Cotswold Hills, part of which are in Worcestershire; these are very general in the southern parts; they are without horns, long woolled, and of large size, having broad loins and full thighs, but rather light in their fore quarters. One cross of the Dishly sort, to add to the Cotswold the principal, or according to some, the only perfection of the Leicestershire, a good fore quarter, is found to answer well; but a second cross is said to be injurious: it diminishes the size of the sheep, and the quantity of wool. The

sheep

sheep of the first cross, when two years and a half old, will weigh from 36 to 40lb. per quarter; the quantity of wool shorn from each sheep, runs from 11 to 14lb. (this weight of a fleece of wool, is, by no means, average weight, or at all general, but has occurred in particular instances only,) which wool, in 1793, sold at 11. per tod, of 28lb. to the tod. This wool has since advanced to 30s. per tod, or more; and since then sunk again to 26s. or 27s. per tod.—*Obs. 1807.*

Mr. Darke says, We breed some of the best Gloucestershire (Cotswold Hill) sheep; we touched on the Leicestershire, but found them, though handsome, rather too small for our rich pastures; we feed what sheep we breed for the London markets. *Mr. Oldacre*—The improvement in stock is rapidly increasing, I mean, in the beast and sheep kind. The waste lands in the south of the county, are generally stocked with Cotswold sheep; those in other parts, with the grey faced above named. The Cotswold is a polled, long woolled, good sized sheep, similar to the former breed of Leicestershire, and has been prevalent on these hills time immemorial; hence it is probable and pretty certain, that the popular idea of the Spanish fine woolled sheep, having been derived from hence, is without foundation, no two varieties of the same animal can be scarcely more distinct; this breed of sheep is deficient in the fore quarter, in which respect they are much improved by crossing with new Leicester rams. The best and most valuable sheep stock in the county, is, however, that which comes nearest to the new Leicester; and, that this is the public opinion, is proved by their fetching, beyond comparison, the highest prices at sales. In the present autumn, a first rate flock was sold, though not in this county, close to its borders, the property

property of Mr. Penrice, of Sawford, just within Warwickshire; the prime ewes bought, by auction, from 10l. to 20l. each; the flock had been crossed for many years by rams, from Messrs. Stone, of Leicestershire; the owner having retired from business, the flock was sold without reserve; similar flocks are in the hands of others within the county, particularly Messrs. Parrott and Oldacre, of Fladbury, Greesley, of Salwarp, and many others.

The Cotswold sheep will bring no more upon sale than they are worth, with a view to mutton and wool; but the high bred sheep are bought with a view to introduce their blood into the flock, and bring about a general improvement of the whole, and, perhaps, an eagerness to take the lead in this, may induce the giving of prices somewhat extravagant.

On the 8th of October, 1805, I attended a sale of part of Lord Coventry's flock by auction; his lordship having, for many years, taken this method of disposing of what he has to spare at stated times, annually, or at longer periods, near 80 head of cattle, and about 250 sheep were thus disposed off; but it must be observed, the sheep being the cullings of the flock, or such only as they chose to part with, could take no more than they were worth with a view to mutton and wool; the breed, Cotswold, with a slight cross of Leicester.

The ewes sold to----- 2l. each.

Wethers ditto two shear---- 2l. 15s. 6d. to 3l. Os. 6d.

Mr. Richard Miller, on Brant Hall farm, has a flock of highly improved Leicester sheep; eighty breeding ewes are kept, and crossed with rams annually procured from his brother, Mr. Thomas Miller, of Dunsall,

stall, near Wolverhampton, whose flock has been highly improved, and is still improving, by crossing with rams from Mr. Honeybourne, Dishley; Farrow Loughborough; Messrs. Stones, Quorndon, and Barrow; Green, Normanton, Leicestershire; and Buckley, Nottinghamshire: three ewes, on the average, rear four lambs, the lambs are generally shorn the first summer; the ewes average 6lb. of wool, and the wethers 8lb. Shear hogs sold to the butcher, March, 1807, at 8d. per lb. and average 21lb. per quarter, price 56s. each; two shear would average 30lb. the quarter, and the aged ewes would feed to 27lb. the quarter.

This flock is never folded, otherwise than by hurdles on turnips; and these, as well as Swedish, and cabbages, are often drawn to them on turf land, in which way they go farther; a little hay is given in severe frost and deep snow, but no corn. In early spring, they graze the watered meadows, and in summer are kept on grass and clover; they are, in general, healthy, and by good shepherding, kept free from distempers.

At the Ryd, Mr. Lechmere's flock are a cross between Spanish and Southdown; the sheep are of a good size, the ewes appear to me large enough to weigh, when fat, from 15 to 18lb. the quarter; the wool of the last season was sold at 2s. 8d. per lb. Mr. Lechmere means to draw his flock still nearer to the Spanish, by farther crossing with a ram of that breed, and thus to continue improving the wool.

Mr. Terrett, at Severn End, has a flock, which he assured me are of the true Ryeland, or Ross, breed, unmixed; and could furnish any gentleman with a few of that sort of the pure blood, but he has of other sorts. He sold his wool of 1807 altogether, at 2s. per lb.; the pure

pure Ross alone would have been worth more, but it went with the rest.

At Lea Castle, Mr. Knight keeps a considerable flock of sheep, and has kept two sorts for comparison, Leicester and Southdown ; of both sorts about 130 breeding ewes, and the whole flock, July, 1807, including lambs, was about 500. Mr. Knight is partial to the Southdown ; but his steward, thinks the Leicester, not only the heaviest, when fat, but generally, when kept together, in best condition, and that they will bear being stocked as many upon an acre as the other ; he believes the Southdown to be rather the most prolific, but thinks even this depends a good deal upon the rams used ; value of the wool per fleece, upon the average, nearly equal, or rather in favour of the Leicester ; thus 6lb. of Leicester wool, per fleece, at 3s. 2d. 7s. ; 3lb. of Southdown, at 2s. 6s. ; but this will depend upon the price of the different sorts of wool.

Mr. Knight intends to fix in fine woolled sheep, Southdown, Ryeland, Merino, and crosses. His steward was gone, September 29, 1807, to meet a jobber, to purchase from him some Ross ewes ; the pure Ross breed is said to be nearly extinct ; he has now a Merino ram, bought of Lord Somerville, of very fine wool, which has got some good looking stock from the Southdown ewes ; also a Southdown ram, bought from the Duke of Bedford at Woburn, at 40 guineas, and another of the same breed, bought at 30 guineas ; believes he shall be able to keep 400 ewes and 100 theaves, which he supposes may produce 500 lambs, which he intends to sell to the butcher, or as stores in autumn, except about 50 ram lambs for wethers and stock, and 100 ewe lambs for succession ; 100 of the aged

aged ewes to be annually drawn off. The extent of Mr. Knight's farm is detailed under the article OCCUPATIONS.

FOLDING.

This practice, except on the common fields, is attempted but by few persons who have valuable flocks; Mr. Knight has made some experiments on folding, which he means to continue, as he wishes to promote every source of manure. Upon a weak sandy loam, for which there was no manure, and not being in time for turnips, the fallow was continued through the winter, and folded with sheep; and, in the spring 1807, sown with barley and seeds, the barley not equal to what might have been expected, I estimated it, in July, at 20 bushels per acre, much inferior to that succeeding turnips with the usual manure; consequently, folding appears to be inferior to the common manure, and turnip husbandry. At Michaelmas, I again viewed this piece of land with Mr. Knight, and found the seeds uncommonly promising; the folding has, consequently, answered better for the seeds than for the barley crop, and, perhaps, their growth might be promoted by the thin crop of barley.

Folding for Wheat.—A 14-acre piece sown on lay or turf, once ploughed, was folded upon by about 200 sheep, from sowing time, the end of September, to the end of February; they went over 12 acres, two acres of the best land had no manure; the whole was drilled with wheat at nine inches, two bushels and a half per acre, the crop light, not exceeding 20 bushels per acre; sort of wheat, the common lammas red straw; here the manure

manure from folding, has hardly answered expectation; 200 sheep went over an acre in about twelve days.

Mr. Knight is making further experiments on folding, which he means to continue. He, this autumn, 1807, folded a large flock of lambs and sheep of all ages on clover lay, the lay a good pasture; they were suffered to range in it, at liberty, in the day time, but were driven into hurdled folds at night, the object of which is to concentrate the dung and urine of the flock to particular points, and prevent any of it being wasted under the hedges; it is admitted here, that Leicester sheep make a better fold than Southdown, 30 of the former being deemed equal to 40 of the latter, they do not suppose the sheep injured here by folding. Mr. Carpenter observes, light lands are best for breeding sheep, and they are, doubtless, best for folding sheep, as their lodging is more dry and wholesome.

On the open fallow fields, sheep are regularly folded, as in other counties; and Mr. C. observes, that, on strong land, great injury is sustained for want of drainage, by which means, sheep, pasturing there, are rotted; they are also subject to hunger, the scab, and an uncertain and irregular supply of food, and these half-starved sheep have the further misfortune to be confined, during the night, in folds to manure the fallows; these different causes give them an unthrifty unkindly appearance; if folding be continued, the sheep ought to be fed with vetches in racks; one would hope no humane person will any longer continue two such barbarous customs as starving and folding.

Mr. C. says, "I have made trial of many breeds of sheep, all of which, by adapting each sort to their proper pasture, have answered well; the large sheep bearing long strong wool, are best suited for rich old pasture;

ture; those of inferior size, are best adapted for seeds and turnips. It is every where allowed that the late Mr. Bakewell had great merit in producing the new Leicester breed of sheep; and so have his successors, Mr. Honeyborn, Messrs. Stone, Mr. Green, Mr. Buckley, and others, in continuing and improving the breed, who also continue to let rams to different parts of the united kingdoms, and the prime ones at high prices. But there can be no other method of perfecting any breed, than in well keeping the stock, and by a succession of good rams, the culls or inferior lambs being parted with, and the best only reserved as breeding stock.

To assist the ewes in lambing time, Mr. C. says, provide some small enclosures near the homeage, and let the grass be there saved; draw the ewes from the flock as they come near lambing, and put them in these small enclosures till they have yeaned, when they may be taken away, and replaced by others till the season is over: many ewes and lambs may be thus saved which might otherwise have been lost, by the opportunity it gives of attending night or day, with the convenience of being supplied with proper food, as turnips or cabbages may be thrown to them, and the ewes be assisted in a bad lambing time. It is the safest to cut the ram lambs when young, at about a week or nine days old; there is less risk then than when they are suffered to grow older.

Mr. C. gives the following receipts for complaints attending sheep:—To prevent the fly breeding maggots on sheep; take two quarts of cold drawn linseed oil, one pound of flour of brimstone, half a pound of the common oil of amber; mix these ingredients well together

together, and anoint the sheep, about a fortnight after they are shorn, along the back from the neck to the tail; the above quantity is sufficient for 80 sheep, and when properly done, I have never known it to fail.

To cure black, or red water, in sheep ; one quart of butter-milk mixed with three spoonfulls of turpentine, to be given at the discretion of the shepherd, according to the state, or increase, of the disorder.

To cure the rot in sheep ; a table spoonfull of oil of turpentine, to six or eight spoonfulls of water, given cold to one sheep, once a week, has, I am assured, cured sheep far gone in this disorder ; but the best way is to prevent the disorder by draining the land, and if that cannot be done, to stock it with cattle instead of sheep.

ON CATTLE, THE DAIRY, &c.

Mr. Carpenter says, "Respecting size of cattle, the richer your pasture, the larger your cattle may be; but those of a moderate size are to be preferred for the dairy, as being calculated to give more milk in proportion to their keep, than very large ones."

A cow is justly ranked very high amongst useful animals; milk is the support of infancy; and roast beef is the king of meat; the article of leather too from the hide, is applicable to numberless important purposes, for shoes, for implements in agriculture, for accoutrements in travelling, for luxury, and self-defence; with many other conveniences from hair, horns, hoofs, &c.

Milk is one of its most useful productions; the articles of butter and cheese rank very high amongst our
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comforts and necessaries ; and their being produced in the greatest quantity and perfection possible, is of considerable importance.

Mr. Carpenter has given the particulars of the process of cheese-making, but as they are well known to every dairy woman, I shall only abstract some of the leading points, after promising that the strictest attention to cleanliness is, in every part of the business, necessary.

When the milk is of a proper warmth, before the runnet is put to it, put a handfull of salt to the milk of every five cows, and so in proportion ; this will make the runnet work quick, and the cheese all salt alike, and less salt will be necessary afterwards ; a great fault consists in breaking up the cheese too soon, before the curd becomes solid ; and the procuring of sweet and well prepared maw skins for making the runnet, cannot be too much attended to.

When the cheese is thoroughly come, which will be in an hour and a half, or two hours, after putting in the runnet, it should only be cut in slices in the tub, and then put into the vat, and well worked by squeezing thoroughly to make it firm and close, then put it into the press, and no more is needful. Cheese thus made, will be the finest, fattest, and best flavoured, as well as the most in quantity.

Cheese is often impregnated with the juice of bruised sage leaves strained out, and mixed with the milk, which gives a green colour ; potatoe tops and parsley have been used in the same way ; marigold flowers also give a colour nearly equal to anotto ; cochineal is also used by the curious, being of a fine pink hue, and has a pretty effect in the hands of an ingenious dairy woman.

But the principal ingredient used for colouring cheese

cheese is anotto, which is thus used : take a piece of Spanish anotto and a bowl of milk, dip the anotto a little into it, then take a stone and rub the wet anotto, washing it into the bowl, till it becomes of a deep colour, and put it into the cheese tub before you put in the runnet or salt, in such quantity as will render the whole a pale orange colour, which will increase in colour after the cheese is made. The anotto is perfectly harmless, void of taste or smell, and used only to please the eye.

At Brant Hall, Mr. Richard Miller keeps a well managed dairy : cows, long horned, twenty, or more, regularly milked, and new milk cheese the principal object, three tons of which are annually made for sale from twenty cows, besides the consumption of a large family, which may be reckoned at half a ton more ; and the making of butter, and rearing of calves, is also attended to ; the cow calves being all reared, and now and then a bull calf for stock, but seldom any for oxen : he is possessed of a very excellent long horned bull of the new Leicester variety. When the cows are drawn from the dairy, they are fattened on the premises, a small lot annually, and young ones introduced ; weight, when fat, eight to nine score the quarter ; they are fattened on the summer's grass, but sometimes kept in stalls, and fed with hay, turnips, cabbages, or barley meal.

Mr. Carpenter says, some are of opinion that particular land is necessary to produce good cheese, but this is not the case ; cheese of a good quality may be produced from any land that is capable of supporting stock in a healthy state, though it must be admitted, the better the land the greater will be the yield. Dairy cows are here in summer, always fed on the summer's

summer's grass ; in winter, they have hay when milked, and when dry, straw, to which is sometimes added a few turnips. Potatoes, turnips, and cabbages, have also been given to new milch cows before grass time, but they should be in limited quantity, being otherwise too cold for their stomachs, and hay should be given in the night, and at intervals.

Mr. Carpenter advises to sow a piece of rye in August, or early in September, for new milch cows in April ; also to tie up milking cows in the day time, during summer, and feed them with vetches, turning them to pasture in the night only ; this, I much approve, but do not find that it is any where practised.

Mr. Carpenter gives the following receipt for making soft or summer cheese :—

" Take six quarts of new milk warm from the cow, the stripings, or last milkings, are best, being the richest milk ; put into it two spoonfulls of runnet, let it stand three quarters of an hour, or till it is hard, coming, or full curd ; put it into the vat with a spoon, not breaking it at all, and laying upon it a trencher or flat board ; press it with a four-pounds weight, or if you find it gets too hard, press it with a lighter weight, turning it with a dry cloth once an hour ; and, when got stiff, shift it every day into fresh grass or rushes ; it will be fit to cut in ten or fourteen days, or sooner, if the weather be warm."

BREEDING CALVES.

There are many graziers who take pains to improve their breed of cattle, in form, blood, and fashion, and to produce such as will get fat in the least time ; with

the dairyman, the object is different, whose care should be to rear both bull and cow calves from those cows that have good bags, or udders, and yield the most milk of the best quality ; but, at the same time, paying due attention to improvement of carcass.

The calves reared where dairies are kept, are generally reared by hand, after having the cows milk for a few days, they have milk given them by hand, then milk pottage ; and, lastly, whey pottage, and whey, when turned to grass; the bull calves are generally turned upon a cow ; which, Mr. Carpenter says, is the cheapest and best method, and produces the best cattle, he, having reared four fine calves upon one cow in one season ; the two first were turned upon the cow early in April, and taken from her at Midsummer, and sent to grass ; two other calves were then put upon the same cow, who kept them till Michaelmas, when they were weaned. Calves should be wintered the first year on turnips, or on hay and picking on grass ground, till spring, when they can be supported by grass alone ; for they will not pay for rearing, unless they are well fed.

CALVING COWS.

Mr. Carpenter remarks, very properly, that, in the early spring months, such calving cows as have been fed with straw, should be well minded when they begin to spring ; at such time they should be put where they can have good hay, or other nutritious food, until they calve, and afterwards to grass, or they will not answer in the dairy.

In the west of the county, Mr. Smith, of Erdiston, keeps mostly Herefords: his dairy consists of a bull and twelve cows of that breed; but he has long horn as well as Herefords for fattening; he gives the summer's grass, and sometimes stall feeds oxen.—See FARM BUILDINGS, Chap. III. At the Ryd, Mr. Lechmere keeps a dairy of seven or eight very fine Yorkshire short horned cows; and as many at the Sink, another farm near, of the same breed; butter and cheese is made for the family, and to spare. A very fine young bull of this breed is in his possession, hired for the season at 30 guineas. Mr. Lechmere grass feeds and stall feeds here Yorkshire cattle, drawn from his own dairy, or bought of jobbers. At Timberden, his other farm, he feeds only Herefords. Mr. Terrett, at Severn End, (the occupation of the late Mr. Lechmere,) has a dairy of capital Herefords, and he grazes and fats principally Herefordshire oxen, but has some of other breeds.

FEEDING CATTLE.

A good many cattle are fattened in this county, not only of its own produce, but bought in from Herefordshire, South Wales, Shropshire, Staffordshire; and by means of jobbers, the short horned Yorkshire, and some Scots, and some from North Wales, are brought in; a good many are drawn off from dairies, and very few sold out of the county otherwise than fat; the principal feeding is in the south and west of the county.

Mr. Knight, of Lea Castle, Wolverley, who grows a considerable breadth of turnips, also stall-feeds a good many

many cattle, with a view, not only of a profitable consumption of the turnips, but also to make good manure of his large quantity of barley straw. In December, 1807, I saw and examined sixteen head of cattle in a shed, six of which were cow or heifer stock, and ten oxen, small Hereford, Pembroke, and one Scotch, intended to be killed for the family use. The shed was merely a lean-to against the side of a barn about twelve feet wide, and long enough to hold twenty head of cattle, or more; the turnips are thrown in a heap at one end of the shed as they are carted home; the cattle are tied to boosy posts, from four to five feet asunder, with a roomy wooden trough, or manger, before them, from two to two feet and a half wide, the whole length of the shed, to contain their food, but no rack or cratch; there is no foddering room before the cattle, but their food is carried up between them; the back part is a row of pillars to support the roof, which, except the necessary gate entrances, is paled up breast high, to keep out swine, or intruders.

The cattle are bought in at neighbouring fairs in the autumn, in different degrees of forwardness, as they can be procured, except a few of the cows drawn from their own dairy; they are fed with whole turnips, root and branch, and hay cut by one of Burrell's machines, of Thetford, given several times a day in the trough before them; with this food they require no water, but are let out in the middle of the day, to rub themselves, and tread the straw in the yard; their dung is also daily wheeled amongst the straw, to improve the compost.

I endeavoured to inquire the quantity of hay and turnips respectively eaten per head, per day or week, but it had not been ascertained. I suspect that a stone

of

of 14lb. weight per day of hay, and one hundred weight of turnips, to each beast, would be a good allowance; this, at 5s. per cwt. hay, and 6s. per cwt. turnips, would be about 8s. per week each beast, and with the labour attending it, they cannot be cheaper well fed.

One principal advantage of thus stall-feeding upon an arable farm, is the improvement and increase of manure; for, in point of profit, it does not promise much upon paper, for an ox, or heifer, thus kept twenty weeks, will cost 8l. and cannot be expected to improve more than the expense. They are, however, thus supported from a small breadth of land; the turnips, for twenty weeks, would thus be seven tons, which, in a tolerably good crop, would be produced on half an acre; the hay would be $17\frac{1}{2}$ cwt. at 112lb. the hundred, which ought to be produced from little more than half an acre also, besides the aftermath; each beast may therefore be reckoned to be fed on the produce of little more than an acre of well cultivated land; the produce is, at this price, well sold at home, the dunghill increased, and the land thereby improved, making the whole a good concern, though not apparently very profitable, when reckoned on paper.

At the Ryd, Mr. Lechmere at present feeds only the short-horn or Yorkshire cattle; 12 were in stalls when I was there; one, a large bull of this breed, feeding for the butcher, a large thick and heavy animal; a second, a young bull, hired for getting stock, at 90 guineas for the season; and ten cows or heifers, part drawn from his own stock, the rest bought from jobbers; they are fed with oil cake and hay, with plenty of water; four cakes per day are given to each feeding beast, weighing about fourteen or fifteen pounds, together

ther with what hay they will eat, of the best quality, which may be about one hundred weight per week : a man will easily attend twenty or more ; the price of oil cake is subject to fluctuation, and a little mystery hangs over this part of the business, which the graziers are unwilling to throw open, under an idea, that, when the high prices they sometimes make of a lot of capital beasts, come to the knowledge of the breeder, it may tend to raise the price of lean stock ; for the breeder of Herefordshire, or long-horn, or other oxen, is rarely the feeder of them, but generally sells them in store order, to be fattened by others.

But I think, when the expenses of stall-feeding come to be detailed, it will by no means have that tendency ; for upon paper those expenses appear so high, as to be enough to deter any one from the practice, unless he be encouraged by a reasonable price, both of store stock, and food for their support, and for making them fat.—Mr. Lechmere informed me, that oil cake in London is sometimes so high as 20l. per thousand, besides carriage down ; and yet, that he buys most of his cake in London : this, if four cakes be given per day, will amount to 1ls. 2d. per week, each beast, in cake only ; but, I believe, the price is oftener about two-thirds of that sum, and sometimes only three cakes are given per day ; but when a beast is meant to be pushed forward, double the usual allowance is often given, or as much as they will eat without danger of cloying them. Thirty-one cakes, he informed me, weigh about a hundred weight, hence 1000 weigh thirty-two hundred weight and a quarter, which at 20l. is upwards of 12s. per hundred weight ; if the price varies from 8l. to 12l. per ton, and 14lb. average weight be given to each beast per day, this makes the expense, for each beast,

7s. to 10s. 6d. per week, in cake only, to which add, 5s. for a hundred of hay, makes 12s. to 15s. 6d. per head per week, and 1s. per week more ought to be added for attendance and stall room, which will make the regular expense near 15s. per week, or 2s. per day each beast is the lowest average. Hence it appears, that if a beast were thus stall-fed through the winter, from the beginning of December to the middle of April, 20 weeks, the expense would be 14l. an expense which but few would repay; or if a beast were laid in early in the spring, and grazed through the summer, suppose 32 weeks at 3s. 4l. 16s. and 20 weeks on hay and oil cake, 14l. total for a year's keep, thus 18l. 16s. a sum which, with the price of the beast, could hardly be expected to be repaid; some cheaper mode of fattening must, therefore, in general be resorted to.

Mr. Lechmere's feeding sheds at the Ryd, are open behind to the yard, but the yard is fenced in, and none but cattle stock admitted, and hogs and other intruders, are kept off by the man in attendance. The cattle are tied to boosy posts, at from four feet and a half to five feet, from middle to middle; before them is a wooden trough or manger, full two feet wide across the top, and before that a foddering bin, four feet wide; the cattle stand in a space about nine feet wide, the whole shed is therefore about 15 feet wide within, and at every four feet nine inches, (the other way lengthwise of the shed,) is a tying for one beast, and a pump is at hand for supplying them with water.

At Timberden Farm, Mr. Lechmere feeds capital Herefordshire oxen, and has different sheds and yards for them, in different stages of fatness, and they are classed and arranged according to their condition in this respect; they are all kept at grass in summer, but when

when winter approaches, and grass fails, they are in part taken to the sheds ; the prime oxen are taken to the finishing sheds, where they are fed with oil cake and the best hay, and have each one a stall, in which they are kept loose, and can turn and move about at pleasure, with each a stone trough for water, to which they have access as often as necessary ; these sheds are furnished with a bin before the troughs, for dealing out the food. The second class are tied to boozy posts, as mentioned before, with a range of troughs before them, and a bin from which they are fed with secondary food, as hay and turnips, but seldom oil cake. The third class have access to a yard, and open shed, lying open to their pasture ; they are supplied in the shed with hay, but are at liberty to go to their pasture. The fourth class are kept in pasture all weather, perhaps a distance from home, but supplied in severe frost, or at other times if necessary, with a small portion of hay and turnips, one, or both, thrown about their pasture.

The following are given, as a sketch, of a set of the best Worcestershire stall-feeding sheds ; they are not exactly copied from any, but those of Mr. Lechmere, at Timberden farm, were principally in idea ; though others, and particularly those erected by the late Mr. Lechmere, at Severn-end, are upon the same principle.

Plate VI.—Shed, No. 1. *a.a.a. &c.* ox-stalls, in which the oxen stand loose, being pent in by the gates *d. e.* which also open to *f.* thus letting the beasts all at once to the watering troughs *f.* without coming together ; these troughs are supplied with water from a pump, *P*, by means of a pipe. *B.* the foddering bin, from whence hay and oil cake are given in the trough ; *c. d. h. i.* section of the tiled roof ; the space behind the standing stalls being unroofed, or left open ; the wall at the back

back of the troughs is built only fence high, and the dung of the cattle thrown over it into the yard.

No. 2. A secondary shed with boosy tyings: *B.* the foddering bin: *c. c.* the troughs for hay or turnips; oil cake seldom given here; if hogs or other stock be admitted into the yard the space between the pillars behind the cattle should be fenced, except the necessary gate or door entrances, and this is done either with gates, or pales, or brick-work fence high, leaving the space above between the pillars open; if the yard be confined to the feeding cattle only, no such fence is necessary.

No. 3. Part of a shed open for the cattle to shelter in at pleasure, with a trough for hay and turnips, and sometimes a cratch or rack against the wall.

At the capital grazing farm of Severn-end, M. Terret has seldom less than from 60 to 100 oxen, much the greater part being prime Herefords; but he has some of other breeds; he has now four very large short-horn, bought at Lord Coventry's annual sale, which will make enormous beasts when fat, but he fears they will lay long on hand; he had between 20 and 30 capital Herefords sold at Smithfield, against Christmas, 1807, some of them in price, exceeding 50l.; has now, Dec. 21, 1807, a shed full of very prime ripe oxen, which will soon find the same road: they are kept in a shed similar to that marked No. 1, being loose and at liberty to turn about: he has, besides, a great many very forward in succession, in secondary sheds, fed with hay and turnips, those in No. 1, being fed with hay and oil cake; a third class have access to the sheds similar to No. 3, for hay or turnips, or range to the pastures at pleasure: and a fourth class are confined to the pastures, but supplied, when necessary, with turnips or hay.— These oxen have generally been worked in Herefordshire,

shire, till six years old ; are then drawn off and sold to the graziers the ensuing summer or autumn ; when laid in lean, they often lay 18 months on the grazier's hands, and it is generally more satisfactory to buy them fresh or forward, and make a quicker dispatch. The prices, when lean, vary from 12l. to 30l. and upwards, according to size and condition ; if bought lean in the spring, they must have the summer's grass, and may be finished the ensuing winter in stalls ; but if bought lean in autumn, they are wintered in the pastures, with the addition of hay and turnips, when necessary ; must afterwards have a summer's grass, and then remain to be finished in the stalls. No account is made of straw here for cattle, except as litter ; and even Mr. Knight, on his arable farm, thinks there is no advantage in feeding cattle with straw in any form ; it affords them little or no nutriment, and their eating it robs the dung-hill ; it is, therefore, either used for litter, or spread plentifully about the yard, where they pick a little of it, and trample the rest to manure. On the feeding farms, straw is scarce even in quantity sufficient for litter : respecting the prices the prime oxen are brought to by the grazier eventually, Mr. Lechmere shewed me particulars on paper, of 12 prime Hereford oxen, which he sent up to Smithfield previous to the show of cattle, December, 1807, and which were there sold, the paper was the salesman's account, and nothing was said against making the result public, though he did not permit me to copy exact particulars.

The highest price was 49l. the lowest 33l. the total amount of 12 oxen, 457l. 10s. average price 38l. 2s. 6d. each ; from this is to be deducted the expense of driving them up, as well as salesman, and keep ; Mr. L. observed, that his neighbour Mr. Terret could shew

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me a more interesting paper, as he had beaten him both in price and number, but I did not see Mr. Terratt's prices.

When the grazier's expenses come to be considered, I do not see much danger of raising the envy of the breeder, by exposing the grazier's prices; for the above cattle must have been on hand a whole winter, and a summer at least, besides being kept on oil cake at a good allowance, for some time previous to being sent up; they very probably cost in, 20l. each or more, which, with their keep and other expenses, would leave little enough of net profit; besides, it must be considered, these were picked out as prime beasts.

SECT. III.—HORSES AND OTHER BEASTS, FOR DRAUGHT AND BURDEN.

The horses are generally of the strong black breed, but not exclusively; other sorts and colours are met with occasionally; and the Worcestershire farmer, not taking pride in himself as a breeder, supplies himself with a horse or a colt when he wants, or thinks proper, at fairs and markets where he can.

The ploughing, husbandry business, and team work, is very generally done by horses. Mr. Pomeroy says, the breed of horses is chiefly confined to those sorts that may be useful in the cultivation of the land; they are, however, much heavier, and of course slower, than appear necessary for that purpose. Perhaps the general construction of the ploughs, and the unwieldy weight of the waggons, together with the badness of many of the parochial roads, may be thought to render them necessary;

necessary ; and there is no doubt, but clay soils require strong machinery, and much greater strength than light land, both in cultivation, and upon the roads.

Mr. Oldacre, of Fladbury, observes, horses are generally used ; oxen sometimes, and drawn single, like horses ; but I never knew a farmer, in the Vale of Evesham, but what was tired of them after a few years' practice. I have to observe, that I believe strong deep clay soils to be the least of all others adapted to draught oxen. Were more oxen introduced into the working stock, it would undoubtedly be a very advantageous improvement. One objection of some weight is this, that they cannot be worked in yokes, upon the declivities of the present high ridges ; and the harness necessary for them, worked in length, is very expensive ; but this will be done away when the ridges are lowered. Their advantage to the owner, in point of keep, expense, and other circumstances, is obvious ; it may not, however, be superfluous to add, that, in those parts, where they are in general use, they are preferred by the graziers. They are worked till they are six years old ; they usually begin at the age of two or three.

Mr. Oldacre observes, the breed of horses leaves room for great improvement. If gentlemen of property would but keep stallions for their tenants and neighbours, paying for the use of them, of the true useful sort, the breed might be soon improved : I will not pretend to determine the sort, only that the clean legged, free from hair as much as possible, are easily kept clean, and are the most healthy.

At Brant Hall, Mr. Richard Miller employs in the farm business of 218 acres, seven stout horses, including a hackney, which draws when not used for the saddle,

saddle, and a breeding mare, which had foaled before March 30, 1807; the sort black and brown, but not heavy, about fifteen hands and a half high, nimble and of quick step; six of them work a six-inch wheel wagon to and from Birmingham, at six miles distant, with a load of from four to six tons; they also work two ploughs in any land, and sometimes a double furrow and a single furrow plough; or three six-inch wheel dung carts on heavy roads: seven draught horses are a very complete set, and will do a great deal of work; but Mr. Miller has never tried oxen. Vetches are grown for the horses.

At Lea Castle, Mr. Knight respecting horses is rather singularly circumstanced: when the situation of public affairs rendered it adviseable for the volunteer cavalry to be raised, he resolved to come forward with a troop raised in his own neighbourhood, and principally at his own expense; to forward which plan, his own heavy cart horses were sold off, and cavalry horses purchased in their stead. He now mounts ten of his own servants, or dependants, upon as many of his own horses, for military service; these horses also do all his extensive farming business, and occasionally serve for saddle horses, or to draw his carriage; they, in part, appear to me of the Yorkshire breed, are of quick step in different paces, either for farming purposes, the road, or the army; were, in part, purchased from army contractors, and the rest picked up promiscuously as the purpose could be answered; they are all constantly kept in the stable the year round, and fed with vetches, carrots, cut hay, or straw, with an additional allowance of a bushel, per head per week, of oats, and a peck of beans; and are constantly kept in exercise, and in active working condition.

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In summer, they are fed with vetches, from the time they are fit to cut, till they get too ripe; two single horse carts can at once draw enough for a night and a day's consumption of twelve horses, who, in July, Mr. Pomeroy and I estimated to consume half an acre per week; they are good and succulent for about a quarter of a year, from the middle of May to the middle of August; soon after which, on this early land, they wither and ripen the seed; in this time, twelve horses will consume six or seven acres, besides their allowance of corn.

Mr. Carpenter says, he kept, in the dry summer, 1794, fourteen horses, besides other cattle, several months on about eight acres of vetches, besides cutting several loads for seed.

He also says, horses will very well eat Swedish turnips, and that he knew an instance of four horses, kept through the spring seed time, the turnips being only washed, and given morning and evening; and it was found that half the allowance of corn usually given, was sufficient. The horses refused good clover when they had Swedish turnips before them. The man who took care of the horses, says this food is equal to carrots for them, as he has proved both; they are proper to give from Christmas to May. I think it would be a great improvement of them for horse food, if, after washing, they were cut by one of Hanford's Leicestershire machines, or by some other adapted for that purpose; and mixed with a little corn, chaff, or cut hay. This plant is not unlikely to become a great resource in the keep of horses.

Mr. Knight has again informed me, that he thinks carrots unfit for the staple food of working horses, as being too laxative to be given alone in quantity, and so stimulating to a horse's stomach, that with a moderate

quantity they will eat as much hay and corn as though they had none; they would thus, perhaps, improve a horse's condition so used, but there is no economy in them thus applied; their highest value is for human food; but they are generally reckoned here of more value for cattle and sheep, than for horses.

Horses (Mr. Carpenter says) are so very useful, that, for various purposes, they cannot be dispensed with, such as for stage waggons, and drawing the heavy loads in London, and other great trading towns, as well as the heavy loads of farmers over the bad roads of clay countries; and for these uses they must be strong and of some weight. There is also a second sort, of a lighter make, very useful in agriculture upon lighter lands, as well as for coaching and the saddle; but those calculated for the road, have, of late years, been too much mixed with the race breed, on account of superior speed; but, for general use, they ought to have a suitable proportion of bone and strength.

He thinks, that if a less number of horses were kept for agriculture, and more oxen were employed, it would be a national benefit; oxen, he says, have been long generally disused in these parts, though tradition informs us, they were formerly generally made use of for the purposes of agriculture.

In the year 1794, he says, he introduced a valuable team of oxen of the Gloucester and Hereford breed, and hired a man of that country to work them; since which, a few more farmers have used oxen at the plough.

I saw very few ox-teams in use, though some are kept, on the west of Severn principally. Mr. Smith, of Erdiston, had an ox-team at work when I was there, and occasionally uses two ox-teams at the plough; upon the Lechmere estate, several plough teams of oxen are

are kept. But Mr. Lechmere, ploughing little himself, does all his draught business with four horses.

The number of farmer's working horses, kept in the county, may be about one to every 30 acres of land, which will amount to about 16,000; to which may be added one-fourth of the number, or 4000, as young or succession stock, and an equal number or 4000 more, kept by gentlemen for pleasure, use, or amusement; this number may also include the young horses for succession, and those employed on rivers, canals, and for all other uses, making, in the whole, 24,000.

A horse kept in the stable and worked the whole year, if well fed, will consume the produce of two acres of corn; a bushel of oats per week, is 52 bushels per annum, and may be reckoned the produce of one acre and a half, besides the seed; and 13 bushels of beans may be called the produce of half an acre, besides seed. For one quarter of the year he may be supplied with vetches, for which, half an acre, if a good crop, will suffice, and the remaining three quarters will require the produce of two acres in hay making; four acres and a half per annum.

Young horses for succession stock, colts, &c. being at grass, generally, or often, in some rough pasture, and seldom fed with corn, except in severe weather, are not so great consumers; I think that two acres of pasture, and half an acre of corn, is a fair allowance for such per annum; and reckoning one-fourth of the latter description in this class, the consumption by horses will be—

	ACRES.
19,000 horses at $4\frac{1}{2}$ acres per head -----	85,500
5000 young ditto, at $2\frac{1}{2}$ ditto -----	12,500

Total .. ----- 98,000
or

or the produce of about one-fifth of the county consumed by horses.

Mr. Carpenter advises, if farmers will keep horses, that some good bony useful mares be kept also, which, if well fed and properly attended to, will do as much work as geldings, except a little hindrance at foaling time, as the profit of a good foal at weaning time, when four or five months old, is a valuable consideration.

MULES

Are also used for agriculture in this county, as well as for the saddle and other uses, a good many having been kept by the late Samuel Skey, Esq. of Spring Grove, near Bewdley, and some of them of a good size, to fifteen hands high or more, and some of nearly a milk white colour, the most beautiful of which were reserved for drawing his carriage, and for which a great price had been offered; they were bred from grey, or white, mares, and a white spotted foreign ass, which he had in his possession many years, but is now dead; all the farm work was here done by these animals, upon a light sandy soil.

At Mr. Teverell's, near Worcester, are also kept seven handsome mules, bred by Mr. Skey, who do all kinds of farm work, and are kept principally on straw in winter, and though kept to hard work, look remarkably sleek and well. Their hardiness is a valuable property, and their longevity a great advantage, as they will perform a deal of work, when only two or three years old, and are in full perfection at thirty, and
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are said to be capable of working to the age of seventy, or upwards.

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ASSES.

Mr. Carpenter, near Bromsgrove, employs a strong gelding ass, with paniers, to carry turnips to his ewes and lambs in winter: and the same practice is adopted by others; some have a folding-door opening outwards at the bottom of the panier, to let out all at once; they are also employed to draw light carriages on the road, as well as to carry burdens: also to haul canal boats, in which office their masters kindly assist, when the strength of the animal is insufficient.

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SECT. IV.—HOGS.

No particular breed of hogs is peculiar to this country; about the farm houses, I generally saw the large slouch-eared sort, and as the farmers here can keep them well, they come to a good weight in due time, and find a ready market in the populous manufacturing country near.

The colour is mostly white; they are fattened with dairy produce, pease, barley, and bean flour; a good deal of bacon is eaten in farm houses by the family and servants.

Mr. Richard Miller, at Brant Hall, has a good thick sort of hogs, light boned and thin hided, keeping themselves fat at all times, and when running about with

common food are generally fat enough for pork ; they have in common, a little dairy produce given them, and sometimes a few potatoes.

SECT. V.—RABBITS.

I do not believe rabbits are any where attended to in this county as an article of profit, or, at least, in very few instances. The only instance I saw of rabbits, was upon the south side of the declivity of Abberley Hill, but had no opportunity of learning whether they were regularly attended to as private property. Mr. Marshall says, they have been neglected on the Cots-wold Hills, which border on this county, on account of breaking their bounds, and straying over the country,

SECT. VI.—PIGEONS

Are kept by gentlemen resident in the country for variety's sake, and the supply of their own tables, also by farmers who happen to rent old mansions where pigeon houses have been formerly erected, and by whom the markets are supplied ; but I do not think them an increasing article ; and, indeed, kept in too great numbers they would be a nuisance, from the depredations they commit in corn fields and in crops ; yet, Mr. Carpenter says, taken in all points of view, and in many situations, they are more profitable than any other sort of the feathered race ; they do best in dove houses, as boxes fixed on the side of houses are subject

subject to many inconveniences. Pigeon's dung is very valuable.—See MANURING. They sometimes require to be fed, particularly in the benting time; I have known ten dozen of young pigeons taken in a very short time from a moderate sized dove house.

Pigeons will sometimes forsake their habitations for want of attention in being fed and kept clean; in which case, you may boil assafœtida in water, and wash their holes with it, and their feathers will receive the scent, which pleases their companions so much, that you will soon have the flock restored.

Cummin seed is reckoned a great enticer of pigeons, by washing their holes in its decoction, or feeding them with grain steeped in such water; perhaps used both ways, it may the better produce the desired effect; I have also found they are very fond of salt, a lump laid in a plate on the dove house floor is very salutary to them, or in a large dove house, the salt may be so put in two or three separate places.

SECT. VII.—POULTRY.

Poultry are an article of secondary consideration, but are domesticated and bred here as in other countries, of the various kinds, turkies, geese, fowls, ducks, and the variety termed gallinæ, from the name of the order to which it belongs, and for want of some other generic name, but called also guinea fowl, and kept for variety by curious persons: they are seldom reckoned upon as a staple article, but are kept for family use, and perquisites or pin money, to the female part of the family.

1. TURKIES.

1. TURKIES,

Mr. Carpenter says, "are held in more estimation than other sorts of tame fowls; they require more attention in rearing, but may be bred in all countries, but do best where there is plenty of growing wood; they are fond of acorns, and their eggs are esteemed delicious; since turkies have become so common, the capons, though a fine fowl, are not so much sought after; however they would be very profitable to those that may cultivate them, on account of their rarity."

2. GERSE.

"In the neighbourhood of commons and waste lands, that have been lately enclosed, there appears a scarcity in the breed of geese, which the poor people had used to rear, and sell them in a lean state to farmers, to fatten in stubbles for the table; but they must for time to come, be bred on the farmer's premises." Geese are reckoned salutary and wholesome to horned cattle; and Mr. Carpenter says, from his own observation, that on farms, where geese are kept to graze with horned cattle, such cattle are less subject to disorders, than where few or no geese are kept.

3. FOWLS.

These are of many sorts, and generally plentiful in country markets; and those who are at the pains to rear

rear them, so as to be early in the spring of the year, find it worth their attention ; the chickens selling at a good price, and at an early state of their growth ; the eggs also of these fowl, produce considerable profit. In November, 1807, eggs were sold at Stourport at 2d. each, as well as in many other places.

The gallinæ, or guinea fowl, are also very prolific, and their eggs much admired ; they have a wild fowl appearance ; their flesh is also much esteemed by some people, who fancy in taste it resembles that of the pheasant.

4. DUCKS.

The breeding of ducks is not so much attended to as it ought to be, in particular when we consider the great use they are of to grass lands, and more so to cultivated vegetables, in cleaning them from worms, snails, and insects. A gentleman who resided two years in China, told me, (says Mr. Carpenter) that it is the custom of the Chinese, to keep very large flocks of ducks to devour certain reptiles common in that country, and which would otherwise destroy the crops of rice, and I experienced the benefit of the information ; for one year I had a field of flax of about six acres so covered with the slug worm, that the crop was, in many parts, like to be destroyed ; these fat slug worms do almost all the mischief in the night, or early in the morning, and in an hour or two after day light appears they retire into their holes. To put a stop to their depredations, I sent about one hundred ducks of the common sort amongst them, and bargained with a man to attend

attend them properly ; as soon as day light appeared, the ducks were driven to the flax field, and devoured as many of these slug worms as their craws would hold ; the ducks were then pent up till the following morning, when they were again turned out, and this was repeated for about nine days or a fortnight, by which time, the insects were destroyed, and the flax was preserved, and produced a good crop.

If you have no running water near, there are no farm yards where a goose or a duck pond may not be easily made, and filled from the rain or dunghill water ; ducks, in particular, being very fond of thick water. But, if there is plenty of clear pool water, so much the better, as both kinds are fond of a change. The Muscovy duck, is, by much the largest, and finest flavoured, as well as most beautiful and various in colour ; and, what is very remarkable, this last variety will sometimes perch.—*Mr. Carpenter.*

SECT. VIII.—BEEs.

I did not see or hear of any particular cultivation or management of this useful and ingenuous insect. They are kept occasionally by cottagers, and at farm houses ; but I suspect the English climate to be too often overcast, and too irregular, unsteady, and subject to wind and showers, for honey, or wax, to be raised in any great quantity.

Mr. Carpenter says, “ that there are not more of these very industrious insects kept than there are, is to many, a matter of wonder. A number of bee hives is attended with little expense, and considerable profit may

may be made by selling the honey, which is, and may be used, in many instances in the place of sugar : honey also makes an excellent wine called mead, the only sort of made wine of the produce of this nation, that requires no sugar, and is esteemed very fine."

Whether the increase of bees, to the utmost limits of which they are capable, would be consistent with prudence, or general economy, is questionable. Dr. Darwin says, in his *Phytologia*, " a great number of bees must be very injurious to flowers, and, consequently, to the production of fruits, as they plunder the nectaries of their honey, and thence deprive the anthers and stigma of their adapted nourishment; they likewise injure the seminal products of vegetables, by plundering the stamina of flowers of their anther dust, for bee bread ; and also of the wax which covers the anthers for their defence against rain."

He further says, " the bees of one society frequently attack those of another, destroy most of them in battle, and plunder them of their honey ; in this respect, resembling the societies of mankind ; to prevent which, he laid a board of about an inch thick on the bee bench, and set the hive with its mouth exactly on the edge of this board ; he also made a semicircular hollow in the board, and contracted the mouth of the hive, thus fortifying the entrance ; this, in some measure, prevented the attack ; the next day he removed the attacked hive to a distant part of the garden, after which, the war entirely ceased.

CHAP. XV.

RURAL ECONOMY.

SECT. I.—LABOUR, SERVANTS, AND LABOURERS.

THE hours of labour are from six in the morning to six in the evening, during the summer ; in some parts they are from five to seven, with a proportionate increase of pay. In winter, from day break to the close of the evening : during the harvest months there are no fixed hours of beginning or leaving work ; it is regulated by weather and circumstances.

The price of labour, as given below, in 1794, is now somewhat advanced in proportion to the advance in provisions, and may, in 1805, be reckoned at least, upon an average, higher by 20 per cent. or one-fifth of the whole.

The wages of a day labourer, Dr. Nash says, is now; 1805, 1s. 6d. per day.

Price of Labour, 1794.

A shepherd, or man to feed stalled oxen, 11s. to 12s. per week. A carter, 8s. to 9s. Threshers earn by task, 8s. to 9s. Old men and moderate hands, 6s. Mowing grass, per acre, with a gallon of beer, or cyder, 1s. 6d. Reaping wheat, with ditto, 5s. to 6s. Harvest month, with beer, 56s. Women, per day, 6d. to 7d. Masons and carpenters, ditto, 1s. 8d. and wages increasing.—*Mr. Darke.*

Day

Day labourer's wages, with beer, 1s. ; hours of working, six to six ; in winter, from light to dark. Wheat threshing, per bushel, 4d. Barley, ditto, 2½d. Beans, ditto, 2d. Grass mowing, per acre, and six quarts of beer, 1s. 8d. Hay making, 1s. 4d. to 1s. 6d. per day, with beer. Harvest month, 30s. and maintenance, or 3l. and beer ; instead of beer, I give five pecks of malt and one pound of hops to each labourer.—*Mr. Oldacre.*

The price of labour varies at different parts of the county ; in 1807 Mr. Richard Miller, at Brant Hall, states it to be as follows :—A labourer in harvest, 1s. 6d. a day, and meat and drink, and the carriage of a load of coals. At other times, 2s. per day, and beer ; or to 2s. 6d. without beer. Waggoner, per annum, 12l. 12s. Man servant, 10l. 10s. Dairy maid, 5l. to 6l. Under maid, 3l. to 5l. Wheat threshing, 7d. Barley, 4d. Oats, 2½d. per bushel. Ploughing, 10s. 6d. per acre.

The average price of labour, with drink (beer, cyder, or perry), is 1s. a day, or 1s. 2d. without, at the choice of the person employed. A true idea of the expense of furnishing drink, will not be formed from the proportion the two prices bear to each other, or from what is usual in most other parts : two gallons a day is now pretty generally considered as the fixed allowance to each man, in the harvest months, but oftentimes there is no restriction. In extenuation of this abuse, it is said that a part is taken home to the families ; but this, when it happens, may be set down as an exception to general custom. Hired servants have the same.

The

The price of labour, mentioned above, is to be understood as that of common day labourers: those who are qualified to undertake, and are entrusted with the care of any particular part of the business, such as the management of feeding cattle, or the care of sheep, receive from 10s. to 12s. a week. Women have 6d. with, or 8d. without drink. The price of piece-work varies in different parts of the county; the customary daily wages being the rule by which it appears to be regulated. The yearly wages of an able man servant, are from 5l. to 7l. a year, exclusive of diet, washing, and lodging; some few, and those chiefly such as are entrusted with the care of the team horses employed on the farm, receive from eight to twelve guineas. Women servants, from 50s. to 4l.—*Mr. Pomeroy.*

1807. Labourers near Bromsgrove, have from 8s. to 10s. per week, and beer, with meat in harvest.

Mr. Knight keeps about half a dozen labourers in constant employ, to do all sorts of work, ploughing as well as other; their wages are 11s. per week in common, and 12s. per week to those who have the care of horses, or other stock; but no regular allowance of beer, but some is given occasionally. In hay and corn harvest they have 15s. per week, and beer, but not board, unless occasionally at the pleasure of their employer.

SECT. II.—PROVISIONS.

Every kind of provisions, necessary for the comforts, or conducing to the luxuries, of mankind, is raised in this county. The rich Vale of Evesham, and the other cultivated

cultivated parts, afford corn, grain, and pulse, of every kind, much more than necessary for the consumption of the county. Sheep and cattle, and the various articles from them produced, are in much greater quantity than the home demand requires ; and the surplus finds a ready market at Birmingham, and in the mining and manufacturing parts of Staffordshire, to which places, grain, and fat ware, are often sold, and the markets there almost wholly supplied from this county with fruit ; corn and meat are consequently generally cheaper here than in the neighbouring places above named.

In a hit of fruit, large quantities of perry and cyder are produced, and the growers of these articles, with their families and dependants, drink this beverage duty free ; but upon sale, wholesale or retail, it becomes subject to the excise.

The various kinds of garden vegetables are raised in great plenty, and some of the rarer and choicer kinds sent to the market of Birmingham.

Excellent salmon, as well as shad, lampreys, and lampern, is caught in the Severn, in the proper season, not only for the supply of the county, but of the above markets ; the county is also well supplied with the other kinds of sea, and fresh-water fish.

An exuberant supply of hops (when a crop) is afforded, both for this county, and the contiguous parts of the kingdom.

Salt.—The salt works of Droitwich afford an inexhaustible store of this article, and of the most excellent quality ; more particulars of which will be given under the article **COMMERCE**.

The price of all kinds of provisions is very much advanced of late years, a principal cause of which, is the great increase of manufactures in the adjoining counties,

counties, more particularly those of Warwickshire and Staffordshire. A second, and perhaps of equal consequence, is the encroachment luxury has made on the mode of living of the inhabitants in general, from which even the farmer is not exempted. There are employed every week, on an average, from twenty to thirty horses, in conveying the productions of the butter and poultry market, from Worcester alone, for the consumption of Birmingham and its neighbourhood, besides what is procured from the markets of Droitwich and Bromsgrove. Those employed in carrying vegetables, and other produce, raised by the Evesham gardeners, are still more numerous. Provisions are not, however, on the whole, particularly dear, the certainty of a ready sale being a sufficient inducement to most of the farmers on the confines of the counties of Gloucester and Hereford, to give a preference to this market; where the average price of butter in summer, is 9d. per pound, in winter, 12d.; good family cheese is seldom under 5d.; beef, those parts which are more particularly called for by the labouring part of the inhabitants, may in general be had in quantities, from 3½d. to 4d., and mutton 4½d.; veal, for a considerable part of the season, 4d. and sometimes under. The price of wheat (at Worcester, where the measure is 8½ gallons), with all the other productions of the corn market, have varied very considerably within the last seven years; at present, many of the articles run remarkably high: the price of wheat, 7s. 6d. to 8s. 2d.; barley, 4s. 6d. to 5s.; oats, 3s. 6d. to 4s. 6d.; horse beans, 6s. 2d. to 7s. 2d.; pease, 6s. 10d. to 7s. 4d.; malt, 7s. 6d.; hops of the best gathering, 3l. 10s. to 5l. The price of cyder and perry is extremely fluctuating. It is necessary to re-

remark, that each town has its peculiar corn measure, and the price varies accordingly ; the Worcester bushel is said to be the least.—*Mr. Pomeroy*, 1794.

Price of provisions, 1794, in the Vale of Evesham : beef, 3*½*d. per lb. ; mutton, 4*½*d. ditto.

Wheat, 7s. 6d. per bushel of 36 quarts ; barley, 5s. 10d. ditto ; beans, 6s. ditto.—*Mr. Oldacre*.

Worcester, Saturday, September 28, 1805 ; measure, nine gallons :—Wheat, 11s. 6d. to 13s. ; barley, 6s. 6d. to 6s. 8d. ; beans, 7s. 6d. to 8s. ; oats, 4s. to 4s. 6d.

Hops, per cwt.—Old, 6l. to 7l. 7s. ; new, 7l. 7s. to 8l. 8s. ; prime, 8l. 8s. to 9l. 9s.

Beef and mutton, 6d. to 6*½*d. per lb. ; lamb, veal, and pork, 6*½*d. to 7d. ditto ; butter, 1s. to 1s. 2d. ditto ; cheese, 7d. to 8d. ditto.

November ; beef somewhat lower, 5d. to 6d. per lb.

Worcester market, at different times, 1807, Saturday, September 26 ; grain measure, nine gallons and a half :—Wheat, 8s. to 10s. 3d. ; barley, 4s. 6d. to 5s. ; pease, 6s. 6d. to 8s. ; beans, 6s. 6d. to 7s. ; oats, 4s. 6d. to 6s. 4d.

Hops, 1280 pockets, sold from 6l. 6s. to 7ls. 7s. per cwt. September 30, at Stourport, 99 ditto, from 6l. to 7l. ditto.

Worcester, October 31st.—Wheat, 8s. to 9s. 2d. ; barley, 5s. to 5s. 4d. ; beans, 6s. 8d. to 7s. 4d. ; oats, 4s. 6d. to 5s. 6d. ; 433 pockets of hops, sold from 5l. to 6l. 6s. per cwt.

WORCESTERSHIRE.]

s

Stourport,

CHAP. XVI.

POLITICAL ECONOMY.

SECT. I.—ROADS.

THE principal roads from town to town, being supported by toll gates, are generally kept in good repair; though, in some of the hilly districts, they are rather stony, rough, and uneven. The toll gates in Worcestershire, however, are neither numerous nor extravagant in their tolls; a good deal of the heavy carriage is taken from off them, by the navigable rivers and canals.

Some of the cross roads are very bad, in the clayey districts, where little attention is paid either to plashing hedges, opening ditches, or mending roads; many of these are scarcely passable from Christmas to Midsummer, either on horseback, or with a loaded carriage; and to this, the inhabitants submit, rather than do, or enforce the statute duty; though it may be observed in mitigation, that, in these districts, proper materials are often scarce or distant, though in most of them, plenty of grit rock stone is to be found near the surface. Mr. Oldacre observes, the public roads are in pretty

pretty good order, but the private roads in general, are much neglected.

According to Mr. Darke, the roads must have been very much improved of late years ; he says, " We have an excellent example for perspicuity and attention at the head of our county, and I have it from the best authority, that the late Judge Perrott used frequently to say, that Lord Coventry had brought a million of money into Worcestershire, from his skilful exertions in making roads through the county."

" The roads are in a very improving state ; we border on perfection. We have a neighbour, Mr. Martin, member for Tewkesbury, who has amply supplied us with advice, with large sums of money, and unremitting attention : by throwing in our mites, instead of being proverbially famed for bad roads round Bredon Hill; we are now as much noted for good ones. Our method is, to form them like a half-barrel ; in false ground we use wood or furze, large stone, then smaller stone, covered with gravel, thick enough to prevent the frost tearing the stone ; this mode, with attention, gives a firm road. As I have before noted, that good roads make good farmers, would it not be a proper proceeding in the Board of Agriculture, to petition parliament, in its justice to take into due consideration the heavy fees of the house upon road acts and enclosure bills."

Mr. Pomeroy observes, the public roads are in the greatest part of the county good, in most tolerable, and every where improving. So much cannot be said of the parochial roads ; these, however, are also gradually improving ; the convex form is here approved and adopted ; the county, in this particular, is much indebted to some of its leading characters.

ROAD CLUB.

The laudable exertions of the society of the Vale of Evesham, for the improvement of the roads in their neighbourhood, deserves notice; they have the pleasure of seeing their district assume a new face under their endeavours; and, instead of being, as formerly, studiously avoided, from the difficulty and danger of travelling, they have now to congratulate themselves and the public, on a safe and pleasant communication; an agreeable embellishment, if not improvement, is the practice they have adopted of fixing the name on some conspicuous place at the entrance of every village. As I think the proceedings of this club worthy of imitation in clay countries, and unimproved bad roads, they are here added, and will, I hope, be preserved.

**RULES AND REGULATIONS FOR THE ESTABLISHMENT OF A SOCIETY
TO BE CALLED THE VALE OF EVESHAM ROAD CLUB.**

ARTICLE I.

THAT this Society shall commence on the first Thursday in September, 1792, and the members thereof, consist of persons resident in the neighbourhood of Bredon Hill.

II. That the members shall dine together on the said first Thursday in September, 1792, and in every succeeding month, at half past two o'clock, at the undermentioned places, in rotation, viz.

The first Thursday in	
September,	Crown, in Evesham.
October,	Angel, in Pershore.
November,	Swan, in Tewkesbury.
December,	White Hart, in Winchcomb.

The

The first Thursday in

January,	Crown, in Evesham.
February,	Angel, in Pershore.
March,	Swan, in Tewkesbury.
April,	White Hart, in Winchcombe.
May,	Crown, in Evesham.
June,	Angel, in Pershore.
July,	Swan, in Tewkesbury.
August,	White Hart, in Winchcombe.

Dinner to be provided at half-a-crown per head, and half-a-crown for liquor, &c. so that the reckoning shall not exceed five shillings each when the bill is called for, which will be always at six o'clock. Any member not attending, to give notice to the landlord of the inn, one week before each meeting, or pay half-a-crown for dinner, which must be provided according to the number expected.

N.B. It is hoped, that the notice required from absenting members will appear necessary, and be cheerfully complied with, for the reason before given; but, although the meetings are proposed to be monthly, it is by no means required that any member should attend more frequently than may be perfectly convenient. There will be no expense for non-attendance, and the only trouble to be incurred, will be a note to the landlord of the inn, that Mr. _____ will not be present.

III. That any three, or more, members, assembled as aforesaid, shall have full power to transact any business, or affairs, relating to this Society.

IV. That all who become members, shall accede to an agreement of the inhabitants of Beckford, Overbury, Kemerton, and Bredon, entered into the 18th of September, 1788, in the following terms:—

“ We, the undersigned, inhabitants of Beckford, Overbury, Kemerton, and Bredon, feeling very sensibly the inconvenience arising from the bad state of the roads in our neighbourhood, and wishing to act cordially and unitedly, in the best manner, for the improvement of the said roads, do declare, that it is our intention, from this time, to exert our utmost influence, by advice and example, to put the laws relating thereto in strict execution; and, for this purpose, we will be ready and willing to serve (at least in our turns) as Surveyors of the Roads in our respective

" respective parishes; and we strongly recommend to the parishioners to appoint such persons, as shall be most likely to execute the duties of that office, with regularity, impartiality, and diligence.

" Signed, William Wakeman, John Darke, James Martin, R. Speediman, John Parsons, Henry White, J. Biddle, Roger Parry, William Heckes, William Freeman, Thomas Gibbs, Charles Tidmarsh, John Bricknell, John Alcock, Isaac Nind.

" The above Subscribers give notice to all parishes adjacent, that if the repairs of their respective roads are not more seriously attended to than they have been (the statute labour for which, duly performed, will in a great measure be sufficient), they are determined to unite in indicting such defaulters."

That, in order to excite the steady attention of the several members of this Society, to the improvement of the roads in their respective parishes, and diffuse a general knowledge of the plan and intent of this institution, these rules and regulations, together with the following advice to surveyors, shall be printed on a large paper, in the most legible manner, and framed and fixed up in the hall, or most frequented room, in the dwelling-house of each of the said members, as well as on the church doors, in the markets, and other places of public resort in their neighbourhood.

ADVICE TO SURVEYORS OF THE HIGHWAYS, AND ALL PERSONS EMPLOYED IN FORMING OR REPAIRING THEM.

The public roads and highways in many parts of the counties of Gloucester and Worcester, having, by long neglect, become dangerous and unsafe for travelling, an association for enforcing the due execution of the road laws, has been entered into by gentlemen residing in the neighbourhood of Bredon Hill; who wish to draw the serious attention of surveyors of the highways, to an object of such importance, and animate them to a diligent and faithful discharge of their duty; and to such of them as are not well skilled in the most essential part of their office, the following easy directions are recommended (adapted to almost any soil or situation).

TO MAKE A GOOD DURABLE ROAD.

The intended road being laid out, the surface of the natural soil should not be reduced to a dead level, but left rounded from the

the trenches that are made to carry off the water; it should then be laid with small brushwood (such as is cut from the hedges), the twigs lying crosswise the road, or with furze, or both mixed, and upon that the stones, placing the largest at the bottom, and decreasing in size to the gravel, or whatever small materials you have for the last finish to the covering.

N. B. No stone should be used for making or repairing the roads, but such as has been exposed to the air for twelve months at least; as, when first taken out of the quarry, it is soft and moulder.

* * Small stones, which lie in great quantities on some parts of Bredon and other hills, are excellent materials, and might be collected and laid in heaps at a reasonable expense, for the use of the highways.

It is also most earnestly recommended to the consideration of such surveyors, that no road can be well prepared to receive the materials, nor preserved in a good state afterwards, unless the hedges and ditches by the sides thereof, are properly cut and opened, at the usual seasons directed by act of parliament for that purpose; and convenient drains laid in proper situations, for diverting any stream, or water-course, that might be injurious thereto; and also, that unless a sufficient foundation of furze and green brushwood, as above-mentioned, be laid under the stones, gravel, or other materials, the expense and labour will, in a great measure, be thrown away, and in no degree answer the intended purpose of public utility and advantage.

Every person (of any observation) must be sensible that the beauty of the country is very considerably defaced by the lopping and pollarding of trees, growing by the sides of highways; and it has been found, by experience, that the object of preserving the roads by such practice, is not obtained; the obstruction of the sun and wind arising chiefly, if not altogether, from the hedges being uncut, and often placed upon high banks, which prevent both heat and air from having that good effect which would naturally proceed from them without these hindrances: on the contrary, trees do actually defend the highways from rain in summer; and in winter they can be of little or no prejudice, being deprived of their leaves during the whole of that season: these considerations are also most earnestly recommended to the attention of all concerned in the making or repairing of roads.

It

It is very evident, that roads are materially damaged by the over-loading of narrow-wheeled carriages contrary to law; and the general turnpike act expressly declares, " That no waggon, or other four-wheeled carriage, having the fellies of the wheels of less breadth than six inches, shall pass on any turnpike road with more than four horses; nor any cart, or other two-wheeled carriage, having the fellies of the wheels of less breadth than six inches, shall pass on any turnpike road with more than three horses; on pain that the owner of every such carriage shall forfeit 5*l.* and the driver (not being the owner), 20*s.* to any person who shall sue for the same." But however punctually the laws relating to highways may be observed and enforced, it may be further remarked, that a constant and unremitting attention is requisite, for the due ordering and preservation of the roads; and, that all surveyors should be careful to cause all obstructions and nuisances to be removed, the ruts and quarters filled and levelled, and occasional supplies of stone and gravel laid thereon, in such a manner as to render the surface of the roads smooth, regular, and easy, (the neglect of which has been found extremely prejudicial and inconvenient): it might therefore be very proper, that each parish should leave a sufficient number of labourers for that particular work; and that each of those labourers should be appointed to take care of a certain portion or extent of road, and to keep the part allotted to him in perfect order: such management would effectually preserve the roads, and prevent the necessity of more expensive repairs, which must otherwise be frequently wanting.

If the method prescribed by the general road act, of the 13 Geo. III. for the stating and settling of surveyors' accounts, was more strictly observed, instead of the manner too generally adopted, of passing those accounts, without any previous examination, at the special sessions held annually for the highways, when (by reason of the short time allotted for the business of that meeting) it is impossible for the magistrates to enter into a thorough investigation of such accounts; it might have a very serviceable effect upon the conduct of surveyors, by compelling them to a more punctual and regular performance of so necessary a part of their duty: it is therefore to be wished, that the magistrates who attend at such special sessions, would resolve in future, that all surveyors shall render a full and particular account, as well of all work and duty performed by teams and labourers; as also of all assessments, compositions,

compositions, and sums of money by them received and expended, for the amendment and preservation of the highways within their respective parishes; and that no such accounts be passed at such special sessions, unless it shall appear to have been previously produced at a public meeting of the inhabitants (testified by the signatures of at least two of them), and afterwards examined and allowed by a proper magistrate, according to the directions of the before-mentioned act of parliament: and, in order that all the surveyors may have due notice of such resolutions, it is proposed, that the same be inserted in the instructions subjoined to their warrants of appointment. It may be reasonably presumed, that the legislature intended the surveyors' accounts should be examined by the nearest magistrate, who, from his own observation, or from local evidence, might be able to judge in what manner the duty had been performed.

The gentlemen of the association wish to have it thoroughly understood, that as they are absolutely determined to exert their utmost power and influence, in putting the laws respecting the highways into execution, and enforcing the same; so they will be willing, ready, and happy, to give every friendly assistance and encouragement, to such as shall conform to their duty in this matter, which is so essential to the comfort and advantage of the neighbourhood.

It is much to be desired that no person will become members of this society, who are not really and earnestly disposed to act up to the spirit of its institution, and to embrace every opportunity of promoting its object, which is the improvement of the roads in their respective parishes particularly, and in the neighbourhood in general: to impress this object more forcibly, the following very pertinent observations are extracted from a charge delivered to the grand jury, at a quarter sessions for the county of Worcester,

" Bad roads are the only blemish and disgrace of this our country; happy beyond every other in the kingdom, in its situation, soil, variety, and plenty of produce, which extends to every necessary of life: why are we, in respect to our highways, behind-hand with almost all our borderers? let us vindicate ourselves from the reproaches of every traveller; not for his sake alone, but our own; for, not to mention the loss that all our trade, commerce, and husbandry, sustain from the badness of our roads, it deprives the county of its social pleasures and connexions; you too well know,

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that in the winter, when the cheerless season of the year invites, and requires, society and good fellowship, the intercourse of neighbours, few miles distant from each other, cannot be kept up, without imminent danger of their limbs or lives: in general, your surveyors are negligent of their duties to a shameful degree: they throw the blame on the remissness of the individuals in their district: wherever the fault lies, the fact of inattention is certain; and an evil to which we ought, all of us, to endeavour to apply a remedy as far as we are able, by duly enforcing the present laws for the amendment of the highways, until it shall please the wisdom of parliament to furnish us with better."

SECT. II.—NAVIGABLE RIVERS AND CANALS.

The fine and noble river (the second in the kingdom) the Severn, enters this county near Bewdley, and after passing through it thirty miles, leaves it near Tewkesbury; its channel is generally eighty, or one hundred yards wide, sometimes much more; and four, five, or six, yards deep; in a fresh of water it runs full channel, and in floods overflows its banks; and has been navigated with barges of about sixty tons burden, for time immemorial. In the lower part of the county the river is, at all times, a deep still water, but from thence to the upper part, the channel rises about thirty feet; and when the water is low, which generally occurs the latter part of every summer, presents a number of shoals or shallows, which can only be navigated with a small burden, and at this season the navigation is obstructed.

The Severn is a free river for whoever chuses to embark upon it, without toll or tonnage. The barges against the stream, when not favoured by the wind, (for they hoist mast and sail) are hauled chiefly by men,

men, ten, twelve, or more, sometimes, at a barge; but lately, horses have been introduced, and it is now not uncommon, to see a horse assisting a smaller number of men in this business; when the wind is favourable, or down the stream, no haulage is necessary.

Several attempts have been made to remove the shoals, and the first engineers of the kingdom have been consulted upon it to little purpose; for, if one of the shoals be removed another forms in its stead; public works have been erected to contract the river in the shallows, and thus deepen the water, but were afterwards indicted as a nuisance and removed by authority. The best remedy seems to be to remove the shoals gradually as they form or increase, and to keep the middle of the channel as regular and uniform as possible; when the autumnal rains fall, the perfect navigation of the river is restored.

The Avon is also navigable for barges, from its junction with the Severn near Tewkesbury, upwards through Pershore and Evesham for twenty miles or upwards, and to Stratford-upon-Avon. Locks have been introduced upon this river to render it at all times navigable.

The Teme is also navigable for barges, from its junction with the Severn near Powick, upwards to a small distance above Powick Bridge. The river, having considerable declivity, its navigation is soon interrupted by shoals and shallows.

The Stour is also navigable for some small distance, and forms a navigable communication between different iron works on the lower part of that river.

The navigable canals, which are a work of modern times, are, 1. The Trent and Severn, or, as it is more commonly called, the Staffordshire and Worcestershire canal;

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canal, one of the early works of Brindley, and completed about the year 1770. This canal enters the county at Wolverley, and after accompanying the Stour (but always upon a higher level) for nine miles, with nine locks, and a fall of ninety feet, communicates with the Severn at Stourport; this canal is constructed for long boats, flat bottomed, seventy feet long, and seven feet wide, burden twenty to twenty-four tons; the depth of water, four feet six inches, and top water, width about thirty feet.

This undertaking has turned out an advantageous concern, both to its proprietors and the public, fortunate in its general line, which unites the Severn and Trent, and nearly at right angles with both; passing near the inexhaustible coal and lime mines of Staffordshire, and opening a communication from Bristol inland direct to the north of the kingdom, and to the ports of Liverpool and Hull; it has become a kind of general thoroughfare for commerce; an extensive basin having been formed at its junction with the Severn, it is generally crowded with boats and barges; and the new town of Stourport has arisen, with near 200 houses and 1000 inhabitants, forming a commercial town and harbour in the interior of the kingdom, where a bridge has, with great public spirit, been thrown over the Severn, consisting of a single iron arch over its main channel of 150 feet span, and 150 feet rise, and a number of brick arches form the approaches, to the extent both ways of between six and seven hundred feet.

The Droitwich canal, from that town to the Severn, was also constructed soon after the former by Brindley; this is a barge canal, five miles and a half in length, with about sixty feet of fall, and five locks; it cost 25,000l. and, so early as 1782, produced a tonnage of

of 1600*l.* per annum. The principal article carried upon this canal is salt, and coals for making it.

About the year 1790, a barge canal was projected from Birmingham to the Severn deep water, below Worcester, for vessels of sixty tons burden, the ground surveyed, and application made to parliament; this project was undertaken almost in defiance of opposition, expense, and difficulties; strong opposition was made in parliament by other canal proprietors, and persons interested in mill streams stirred up to jealousy and opposition. It was stated to parliament, that the coal country would be exhausted, by increasing the outlets for that article, and the manufactures thereon depending ruined; in consequence of which, by order of parliament, a general survey of the coal country was taken, which, proving satisfactory respecting quantity of coal, and the projectors giving up all claim to mill streams, and undertaking to supply the canal with water from the Heavens, and by a tier of steam engines to pump water from the river Severn, an act was obtained, after soliciting it through two or three sessions of parliament, at the expense of about 15,000*l.*

The canal commences with a tunnel under a hill near Birmingham, and after continuing three or four miles with a six feet water, and bridges built upon a scale for barges to pass under, has two deep valleys to encounter at Selly Oak and Barnbrook End, of four or five hundred yards across, and thirty feet or more in depth; these are filled up with a wet loose marl, dug out of the deep cutting or excavation of the canal, and which, being of a loose texture, was with difficulty kept together, and not without timber to tie it and keep it within bounds; the Barnbrook embankment has a waggon road under the canal bottom, being of sufficient height for

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for that purpose, and to admit the highest loads; these works were completed at an enormous expense, and the cutting in the course of the canal, is often twenty or thirty feet deep.

Between King's Norton and Alvechurch, a very formidable tunnel intervenes, being upwards of a mile in length, and passing through a loose springy marl; this has been long in hand, but is not yet completed so as to be navigable through, being a work of great expense, labour, and difficulty. The lockage of 450 feet fall to the Severn is not yet commenced, so that much remains to be done in completion of this great and public spirited undertaking, which, when finished, will bring the barges of the Severn over valleys and under hills, to along side the wharfs at Birmingham, in a position 150 yards perpendicularly above their usual and natural situation. A communication with the Droitwich canal was intended; also in the course of the canal a basin near the city of Worcester, upon a level considerably above that of the Severn.

The summit level of this canal, from the wharfs at Birmingham, when finished, will be sixteen miles and three quarters in length. Upon this, and its collateral branches, some business is now doing in the conveyance of coals, lime, and other articles.

About the same time, or soon after, a canal was projected across Herefordshire, in the direction of King-ton, Leominster, and to enter Worcestershire near Tenbury, and from thence, across the latter county to Stourport, which would have opened a direct communication with the Staffordshire coal mines, the town of Birmingham, and the Severn. The Herefordshire part is, I believe, finished, and four or five miles cut into Worcestershire, near the coal works of Mamble; but here

here its progress is for the present arrested, by awkward times, untoward circumstances, and scarcity of money. The lockage to the Severn, remaining to be executed on the unfinished part of this canal, is very considerable.

- Dr. Nash observes, " Though the Severn has been navigable from early days, yet the first load of coals brought by it to Worcester, was in the year 1570:

- From 1805 to 1807, the Leominster canal has made no progress; on the Birmingham and Worcester, the great tunnel has been finished, and the summit level made navigable to Tardebigg, about sixteen miles from Birmingham; but the lockage to the Severn is not yet begun, nor the whole of the summit level completed.

SECT. III.—FAIRS.

All the market towns, and several of the principal villages, as Alvechurch, Bellbroughton, Blockley, Eddington, King's Norton, Redditch, &c. have fairs, one or more annually; for the sale of cattle, sheep, horses, hogs, cheese, linen and woollen cloth, wearing apparel, wool, leather, and other articles.

At Worcester, September 19, is held a great annual fair, at which, when hops have been a full crop, a very large quantity of that article is offered to sale by the growers, or planters; this fair is, on such occasions, fully attended by dealers and speculators from the neighbouring counties, and distant parts of the kingdom, and a great deal of business is frequently done.

The following are the fairs, mostly from Oggiby; [WORCESTERSHIRE.] T which,

which, I believe to be correct, having found no errors in my inquiries, compared with his account, but I have made some additions.

Alvechurch, April 22, August 10, for cattle, sheep, and lambs.

Bellbroughton, first Monday in April; Monday before St. Luke's, (October 18) for horned cattle, horses, and cheese.

Bewdley, April 23, for horned cattle, horses, cheese, linen and woollen cloth; December 10, for hogs only; 11th, for horned cattle, cheese, horses, linen and woolen cloth.

Blockley, Tuesday after Easter week, for a few cattle; October 20th, a mop, or statute, for hiring servants.

Bromsgrove, June 24, October 1, for linen cloth, cheese, horses, and cattle.

Droitwich, Good Friday, October 28, December 21, for linen cloth, and hats.

Dudley, May 8, for cattle, wool, and cheese; Aug. 5, for sheep, lambs, and cattle; October 2, for horses, cattle, wool, and cheese.

Evesham, February 2, Monday after Easter week, Whit-Monday, September 21, for cattle and horses.

Feckenham, March 26, September 30, for cattle.

Kidderminster, Holy Thursday, and three weeks after, September 4, for cattle, horses, cheese, linen and woollen cloth.

King's Norton, April 25, September 5, for all sorts of cattle.

Pershore, Easter Tuesday, June 26, Tuesday before All Saints; November 1, for cattle and horses.

Redditch, first Monday in August, for all sorts of cattle.

Shipston,

Shipston, June 22, Tuesday after October 10, for horses, cows, and sheep.

Stourbridge, March 29, for horses (very noted) and other cattle; September 8, for all sorts of cattle and sheep.

Stourport, weekly, on Wednesdays, from September to Christmas, for hops.

Tenbury, April 26, July 18, September 26, for horned cattle, horses, and sheep.

Upton, Midlent Thursday, Whitsun-Thursday, for horses, cattle, and sheep; July 10, Thursday before St. Matthew (September 21), for horses, cattle, sheep, and leather.

Worcester, Saturday before Palm Sunday, Saturday in Easter week, for horses and linen cloth; August 15, September 19, for cattle, horses, cheese, lambs, linen, and hops.

SECT. IV.—WEEKLY MARKETS.

Large weekly markets are held at Worcester on Saturdays, for the sale of grain, pulse, flour, malt, hops, butcher's meat, fish, fruit, butter, cheese, and most other articles.

In the summer season, Dr. Nash relates, that several tons of cherries are frequently sold here very early in the morning, to dealers in that article, from Birmingham, Wolverhampton, and the north.

Immediately after the great fair of September 19, this market (particularly in plentiful seasons of that article) is filled with hops, by the growers and planters of, and speculators in, that article; this continues to Christmas,

Christmas, and the market is attended the whole year by hop dealers, who have always a stock of that article in the warehouses ready for sale; this place being the great mart for hops, not only the produce of this county, but of the two adjoining ones of Gloucester and Hereford.

Most of the hop dealers are also dealers in the seeds of clover, trefoil, and ray grass, of which large quantities are sold wholesale and retail in this market.

In the fruit season, and in cyder and perry years, large quantities of those articles are also sold in this market both by the growers and dealers; and Worcester, from its situation on the Severn, and convenient distance from the place of growth, and production of hops, fruit, cyder, and perry, as well as from the populous countries where those articles are consumed, is the greatest mart for them in this part of the kingdom; and its mart and commercial business are so considerable, as well to support half a dozen or more capital inns, besides a number of very decent inferior ones; all of which are oftentimes fully occupied, and, at public times, so much crowded, that it is difficult for a traveller, who is a late comer in, to obtain a comfortable room, and decent accommodations. A great deal of market, fair, and commercial business, is done in this place.—See COMMERCE.

The regular weekly markets in the county are as follows:—

Bewdley----- Saturday.

Bromsgrove ----- Tuesday.

Droitwich ----- Friday.

Dudley ----- Saturday.

Evesham----- Monday.

Kidderminster ----- Thursday.

Pershore

Pershore -----	Tuesday.
Shipston -----	Friday.
Stourbridge-----	Friday.
Stourport -----	Wednesday.
Tenbury -----	Tuesday.
Upton -----	Thursday.

Worcester, Saturday principally; but Wednesday and Friday also market-days.

SECT. V.—MANUFACTURES.

The principal manufacture in the city of Worcester, is that of gloves, which, according to Dr. Nash, employs about 4000 persons in the city, and in the country round about.

Here are also two or more manufactures of porcelain, or China ware, which manufacture has been long established in this city. Messrs. Flight and Barrs, manufacturers of this article, had the honour of his Majesty's patronage, upon his visit to this city some years ago.

Some very good articles are also got up in the cabinet and furniture way, and sold to distant places.

Stourbridge has a manufacture of woollen cloth; and some very fine and good cloth is there got up from British wool only, produced from the common of Morf. Shropshire.

But the principal manufacture of Stourbridge, is that of glass, which has long flourished both here and at Dudley, and in which, some good fortunes have been made; a good deal of business is also done in the skin-

ner's way, or the manufacturing of sheep skins into leather.

Bromsgrove does something in the wool-combing and spinning way, from long wool; the yarn goes to the stocking weavers of Leicestershire. The town contains about 500 houses, and 3000 inhabitants, and the whole parish of 14,000 acres, about 3000 more; the other manufactures are, linen for wear, for table linen, and sheets, finished and whitened; also needles, made both here and at Redditch. Nailers for small nails, tacks, lath nails, tenter hooks, &c. made all over the parish.

Most of the towns contain tanner's yards, where hides are tanned into leather, and there are curriers who dress it, and prepare it for use. In Dudley, and its neighbourhood, is a considerable manufacture of nails; also, according to Mr. Pomeroy, of needles and fish-hooks. Glass utensils are also manufactured here in great perfection.

Kidderminster has a manufacture of carpets; also of stuffs of worsted, and of silk and worsted. Dr. Nash relates, that in 1772, there were in this place 250 carpet looms, each employing a man and a boy; and 1700 silk and worsted looms, each employing one weaver; that 5000 people, men, women, and children, were then employed in the town and neighbourhood in spinning and preparing yarn. Kidderminster carpets excel in the brilliancy and durability of their colours, towards which, the fitness of the waters of Stour is said to contribute, in scouring and striking the colour.

At present the carpet trade remains undiminished; but that of stuffs has often fluctuated, on account of the

the preference given to cotton, and it is now supposed to be in a reduced state from that above stated.*

The principal produce of Droitwich is salt, of which more particulars are given in the next article.

On the Stour, and its collateral streams, are a number of very considerable iron works, where pig iron from Staffordshire and Shropshire foundries, and elsewhere, is rendered malleable, and worked into bars, rods, sheet iron, and various manufacturing purposes.

Mr. Darke states, that in Bredon, are about from sixty to eighty stocking frames, which employ about one hundred persons dependant on that manufacture in Tewkesbury; this, he says, certainly increases the poor's rates, which I balance by our having an excellent market at Tewkesbury, both for large and small productions; this manufactory is in high credit, and their trade good.

By the returns upon the population act, it appears that more than three-sevenths of the working population of this county, are employed in trade, and less than four-sevenths in agriculture; consequently, the

* The above was the state of the manufactures of Kidderminster at the time referred to, but I am informed in December, 1807, by a respectable manufacturer of the town, that the 1700 silk and worsted looms, each employing one weaver, are now decreased to 700; but, that the 250 carpet looms, each employing a man and a boy, are increased to near 1000; and that the carpet trade is much advanced, and with it the general opulence and commerce of the town, as well as its population.—See SECT. viii. of this Chapter. The advance of the carpet trade has been much greater than the diminution of stuffs, which has shewn itself in the annual erection of extensive buildings of late years, for workshops and warehouses, as well as some pretty extensive villas for the master manufacturers near the town.

consumption of landed produce, by people in trade, bears a large proportion towards one-half of the whole: this must have a very great effect upon the markets; and if to this be added the convenience of being furnished with the manufactured articles at the best hand, there can be no doubt but the manufactures of this county (notwithstanding they increase the poor's rates) are an advantage to agriculture and the landed interest.

SECT. VI.—COMMERCE.

The commerce of this county is considerable, from its own fertility and various products: the convenience of its navigable rivers and canals, and its situation near a populous mining and manufacturing country. It consists in the surplus of its own manufactures, and the export of gloves, China ware, glass, hardware, and Kidderminster goods; but more particularly in that of the landed produce of this and the neighbouring counties; Worcester as named before, being the great mart for the hops, fruit, perry, and cyder, of this part of the kingdom, and which, in good years, amounts to a very great quantity of each article: some very good, and even large fortunes, have been made in these concerns, and particularly in the hop trade; for in a plentiful year of this article, the market is so over stocked, that the price is little or nothing more than the amount of labour and duty, and the merchant who has the command of money, may buy up large quantities upon these terms for speculation, and they are, upon these occasions, good, and better, than in bad seasons;

sons ; the next year, should the crop fail, the price may be doubled or trebled, and the merchant who has a large stock in hand, makes a fortune. This, however, does not always occur, for in the case of a succession of good years, the article kept grows worse, and the holder is sometimes obliged to part with them at a loss, as well as he can.

I have known good Worcestershire hops, many years ago, as low as 2l. 2s. per cwt. and I have known them as high as 15l. 15s. ; the last season, 1804, was a good one, and they were as low as from 4l. 4s. to 4l. 10s. per cwt. which, I was assured, gave little or no profit to the grower ; they are now, September, 1805, worth from 7l. to 8l. per cwt. the best sort.

Fruit, in its raw state, being a perishable article, is not liable to much fluctuation, except from plentiful or scarce produce ; but perry and cyder being kept from plentiful to scarce seasons, rises in price similar to hops, though not in so great a degree, as being articles (in the present taste of mankind) of less pressing necessity.

Clover and grass seeds, corn, beans, flour, malt, salmon, fat cattle, sheep, lambs, hogs, hay, timber, and pole wood, are also commercial articles of this county.

The navigation of the Severn tends greatly to promote the commerce of this county ; a number of respectable individuals, under the name of owners, employ barges and trows upon this river, between Bristol and Stourport, and upwards into Shropshire, to convey the various kinds of merchandize and manufactured goods up and down the river ; many of them also keep canal boats, to continue such conveyance into the interior and north of the kingdom.

At Stourport is always a large stock of Staffordshire coals,

coals ready to supply the Severn trade; coals are also brought down the Severn from Shropshire.

The produce of salt at Droitwich is very considerable. Dr. Nash relates, that these salt-works are upon record from the year 816, when salt furnaces were named at this place, in a deed of Kenulph, King of the Mercians.

The following are particulars of the different stratum above the salt on the premises of Richard Norris, Esq. 1779; from the surface, mould five feet, marl 35 feet, talc, (a gypsum or alabaster) 40 feet, then a river of brine, 22 inches, then talc 75 feet, then a rock of salt into which the workmen bored five feet.

The brine is inexhaustible; any one, for the yearly rent of 3*l.* may have as much as he pleases. The profits to the proprietors are very small, the price, or prime cost of salt, exclusive of duty and profit, being only about 5*d.* per bushel.—*Dr. Nash.*

On boring through the talc, the brine immediately arises and fills the pit.

Salt made here and sold in one year, from April 5, 1771, to April 5, 1772, 604,579 bushels; of which, exported abroad, 110,120 bushels.

Duty paid into the Salt Office, London, 61,457*l.* which was then nearly one-third of the whole revenue from salt in England.

The progress of making salt at Droitwich, is as follows:—A little common water is first put into the pan, to keep the brine from burning to the bottom, the pan is then filled with brine, and a small piece of resin thrown in to make it granulate fine; when the brine is boiling, the salt first incrusts at the top, and then subsides to the bottom; when subsided, the persons employed lade it out with an iron skimmer, and put it

into wicker barrows, each containing about half a bushel, in the shape of a sugar loaf, and let them stand at the side of the pan for some minutes to drain ; they then drop the salt out of the barrow, and place it in the stove to harden.

They boil a pan-full of brine in about twenty-four hours, the drawing out they call a lade ; 14 or 15 cwt. of good coal will, with care, boil a ton or 40 bushels of salt ; they usually boil the brine very fast, which makes the salt weak, and of a fine grain, for the violent coction deprives the salt of part of its acid spirit. The best salt for pickling is from a heat not much greater than solar heat.

By Dr. Johnson's analysis, a bottle of Droitwich brine, weight, with the bottle, 4lb. 3 $\frac{1}{2}$ oz. weighed with Malvern water 3lb. 12 $\frac{1}{2}$ oz. ; and 4lb. 7 $\frac{1}{2}$ oz. of brine in a heat of 70° Fahrenheit, produced salt, when dried, 1lb. 3 $\frac{1}{2}$ oz. more than one-fourth its whole weight, perfectly free from bittern, and every foreign admixture. The strength of the Droitwich brine, exceeds that of any other we are informed of, except Barton, Lancashire, and some pits at Northwich.

Sea water on our coasts, seldom contains more than one-thirtieth, and to one-fiftieth, of sea salt. Nantwich and Northwich yield one-sixth, and Weston, Staffordshire, one-ninth part of salt.

The Droitwich brine certainly exceeds all others, and is, perhaps, one of the richest sources of sea salt in the world in purity.

In 1755, Mr. Baker, a druggist from London, spent 12,000l. in a project for conveying the Droitwich brine in pipes to the Severn, without success.

Dr. Nash, from experiment, believes Droitwich salt to be neither a manure in itself, nor capable of exciting any

any vegetative principle in the earth; as animal or vegetable salts, or lime may do; it produces bad effects on ploughed lands, by increasing their dryness in hot weather, and by making them greasy, and what the farmers call raw in damp weather.

He has found it serviceable to scatter foul salt upon large heaps of manure, to kill weeds, and destroy their seeds, but not to enrich; care must be taken that it be not laid near the roots of trees, as it will certainly destroy them.

If laid at the bottom of pools, it enables them to hold water; it is wholesome to granivorous, and graminivorous, animals, but prejudicial to carnivorous ones.

Dr. Nash says, further on the subject of salt, 1805, "Having a considerable estate at Droitwich, I sunk a pit there, at the expense of 30l. sufficient to furnish salt for half the kingdom, and now let it for 9l. 10s. per annum. A bushel of salt, without duty, is worth about 5d. or not so much; with the duty, the labourer, who salts his pig, pays above 15s."

But I apprehend some mistake or omission in this calculation, as the coal delivered at Droitwich will cost most of the money; to this is to be added labour, rent of salt pits, and of buildings necessary in the trade, furnaces, tools, machinery, interest of capital, &c.; the duty, however, forms a very large proportion of the price of the article.

Mr. Pomeroy says, "The produce exported is chiefly fruit, cyder, perry, and hops; considerable numbers of fat cattle, sheep, and hogs, are also sent to London, and the large manufacturing towns of the counties of Warwick and Stafford. The quantity of wool is estimated at 2000 packs, of 240lb. each, value from 10l. to 16l. per pack. But the principal source of

of wealth, in its commerce with the different parts of this, and other countries, arises from its fruit, perry, cyder, and hops. The former is now growing into an article of considerable consequence, and deserves particular attention, more especially as the demand for it, in the large manufacturing towns of the north, and all the intermediate country, increasing yearly, promises a certain and ample recompence for the greatest exertions that can be made in this branch of its rural economy. Some idea may be formed, from the following circumstances, of the quantity exported, and the price it bears. The average tonnage of fruit sent by water into the north, for the last three years, amounts to 1500 tons [in the year 1791 it exceeded 2094 tons], each ton weighing equal to fifteen horse pots, the measure by which it is commonly sold, making 22,500 pots. The pot holds about five pecks.

The fruit sold in Worcester market, is allowed to amount to (and the circumstance is fully confirmed by the rent given for the toll paid on it) 1000 pots per week, on an average of the last five months of the year.

In ascertaining the value of the produce, as an article of commerce, the two preceding months may be safely excluded; for though the number in these certainly falls short of this estimate, the superior value of the early fruits will amply compensate for the deficiency. Seven months, or thirty weeks, at 1000 pots per week, give 90,000; supposing one-half of this quantity to be sent by water, and making part of the home consumption, there will remain 15,000 pots not deducted for the estimate of the water carriage. Under these two heads, some part, the produce of Herefordshire, is included, perhaps an eighth of the whole;

whole ; which, when deducted, leaves the number 28,125 pots. Not more than half the produce in this line exported, is supposed to pass through Worcester ; allotting, therefore, to the markets of Bewdley, Kidderminster, Bromsgrove, &c. &c. and the rest of the county, north of this city, 30,000 pots, the whole amount may be fairly estimated at 58,125 pots. The price varies considerably, from 3s. to 6s. the pot, and some of the inferior sorts under. Four shillings are deemed a low average.

" The quantity of cyder exported, as far as can be collected from the opinions of several principal planters and merchants, may amount to about 10,000 hogsheads, of 110 gallons ; the average price for about ten years past, 3l. per hogshead, as it is delivered from the planter to the merchant. The delivery is often a circumstance of considerable consequence, as they frequently live 10, 12, or 15 miles apart. That is the price of the greater part of the cyder sent out of the county ; there are some few particular sorts, such as stire and golden pippin, which bring from 7l. to 10l. per hogshead ; the quantity of these is not very considerable. The quantity of perry falls short of that of cyder, perhaps it does not reach one-tenth ; but little is exported except the prime sorts, such as the real jaynton, squash, hufcap, &c. these bring from 4l. to 7l. per hogshead.

" The number of acres in the county, planted with hops this year, is 5988. The lowest average places the produce, at six cwt. per acre ; the lowest average price above 3l. 3s. Calculating upon these low estimates, the whole may, with much probability, be stated with the exports."

SECT. VII.—POOR.

According to Dr. Nash, the poor's rates, in the year 1776, throughout this county, amounted to 26,906l. 7s. 5d. and which, by the same authority, was less than 2s. in the pound upon the then rental of the county.

Respecting the labouring poor who maintain themselves, Mr. Darke observes, our labourers are well fed and provided for; without these are made comfortable, our land would be of little value.

The sums raised by poor's rates, are detailed in Chap. IV. Sect. 4; and supposed now to amount annually to about 90,000l.; being 3s. in the pound upon the full actual value, and about from 12s. to 13s. per head, on the whole population. Mr. Carpenter informed me, that the poor's rates of Bromsgrove, about the middle of the last century, were only 300l. per annum; in 1801, they amounted to 6000l. but are now settled to about 3500l. per annum: the parish contains 12,000 acres old, and 2000 new enclosure, and about 6000 inhabitants. Very little of the poor's rate is received by farm labourers, or the landed interest; it principally goes to the support of manufacturers.

Mr. Carpenter thinks, the poor are much the best and cheapest provided for in small parishes; and that, in large parishes, it is much the best for each hamlet, or division, to provide for their poor separately, their wants being thus much better known, and easier redressed; also that the custom of appointing every year fresh overseers is very defective; by the time they have acquired some knowledge of the business, their time of office is expired. Large parishes, he says, should either be divided, or a proper standing overseer appointed,

pointed, with a competent salary; his accounts to be inspected monthly by a select committee of parishioners. He thinks poor families in distress should not be relieved by weekly pay, but rather by a liberal supply upon the occasion, and the habit of weekly pay kept off if possible; that much might be done by mending the morals of the lower classes, by rewarding the frugal and diligent, and by promoting societies, or clubs, under proper regulations; and says, it would be well if a handsome premium were offered for the best plan of a box-club society; which, he thinks, under due encouragement from those who now pay the rates, might, at no very remote period, prevent the payment of any other rates whatever.

SECT. VIII.—POPULATION.

Dr. Nash states the population of Worcester city and suburbs, in 1782, to have been 2449 houses, and 13,104 inhabitants, including 10 parishes, besides college precincts; the burials, in one year, near that time, were 451, and births 449, which gives rather more than one in thirty dying in a year. It is not easy to estimate, whether the population has, since that time, increased. The manufactures are stationary, and few new erections have taken place.

Kidderminster, by the same authority, contained in 1773, 1180 houses, 2949 males, 2800 females; total 5749: but, since that time, shews no symptoms of increase. Part of its manufactures is stationary, and part fluctuating; but is of that nature that children can be employed in preparing the yarn at a very early

age,

age, and thus earning a livelihood, are very little burden to their parents.

Stourbridge and Dudley are, from their staple manufactures, together with their respective neighbourhoods, very populous. Stourport has arisen in consequence of the Trent and Severn canal, a new town or port, and is on the increase. Most of the other towns, together with the agricultural department, remain, respecting population, I suppose, nearly stationary.

By the returns upon the population act, as published in the Monthly Magazine, Worcestershire contains as follows:—Houses 26,711, families 29,741, males 67,631, females 71,702; total inhabitants 139,333. Employed in trade 30,230, in agriculture 38,865—69095; leaving rather more than half, or 70,238, I suppose, in a state of infancy, superannuated, employed in professions, living on their property, or without employment.

This population is considerable, being about 180 upon a square mile, 152 being nearly the average population of England and Wales; of which, this county forms but a sixty-fourth part, but gives a much larger proportion of those articles which are necessary for the subsistence and comforts of mankind.

CHAP. XVII.

OBSTACLES TO IMPROVEMENT.

INCLUDING GENERAL OBSERVATIONS ON AGRICULTURAL
LEGISLATION AND POLICE.

TYTHES have been before mentioned as obstacles to the improvement of all cultivated lands where they are taken in kind ; they are particularly complained of in those articles, which require a laboured or operose cultivation.

THE WANT OF LEASES.

Proprietors granting leases for a sufficient length of time, would tend to excite a spirit of improvement in the occupiers, not only in the tillage land, but in the grass land and planting. The latter practice, I am sorry to see neglected ; as in most farms there are some pieces, or placks, that might be fixed for some kind of plantation. The improvement of all quickset fences, I think the country more behind in, than in most other.—
Mr. Oldacre

BAD ROADS.

Some of the parochial roads, through districts of fine land, are so very bad as to be scarcely passable for a traveller, particularly in wet seasons ; and still less so for manure. The value and produce of land may be much improved by facility of communication ; it must, however, be confessed, that some progress is gradually making in this species of improvement.

There is one inconvenience much against improvements in farms, where the old enclosures run very small, as from one to three or four acres each, intermixed, and the owners not inclined to accommodate each other, which I am very often sorry to see ; but when they are disposed so to do, circumstances often occur to prevent it, such as part belonging to leasehold property, and part to freehold. An act of parliament, appointing commissioners for such purposes, in general might remedy it.—*Mr. Oldacre.*

COMMON FIELDS AND WASTE LANDS.

These, in their present state of intermixture and unappropriation, can hardly be expected to be much improved, it being a business in which a whole neighbourhood cannot easily be brought to join cordially ; they will scarcely arrive at their highest improvement but by subdivision and enclosure.

As ignorance is one of the greatest obstacles to improvement, the way to remove it must be the dissemination

nation

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nation of useful knowledge. The following proposals appeared in the Worcester paper :—

A PLAN FOR VILLAGE AND PARISH LIBRARIES.

It is proposed to establish, in every village or parish in the kingdom, a small library, consisting chiefly of books of agriculture, history, modern voyages and travels, and other subjects of rational instruction and general utility.

The funds for commencing and maintaining such a library, to be raised by a subscription of 5s. per quarter for three years, and of 2s. 6d. per quarter afterwards.

The resident clergyman, for the time being, to be president of the society, and a treasurer to be appointed annually from among the subscribers.

The subscriptions to be received, the accounts to be kept, and the books to be circulated and registered by the parish clerk, or by the parish schoolmaster, who, besides having the use of the books for his own reading, is to be entitled to the fines.

The books to be kept at the vestry room, at the house of the officiating clergyman, or at any other convenient place, in a room which shall be accessible to the subscribers.

Quarterly meetings to be held of the subscribers at the place where the books are kept, when new books are to be ordered, accounts stated, and regulations formed.

No book to be kept for reading more than a month, under the forfeiture of 1d. per day afterwards, and no magazine, review, or pamphlet, to be kept more than five days under a similar penalty.

The first object of such a society, should be to possess itself of the County Reports, and other books published by the Board of Agriculture, of Gregory's Cyclopaedia, some of Arrowsmith's Maps, Dickson's Agriculture, a System of Geography, Mavor's Universal History, Johnson's Dictionary, and Hume and Belsham's (the last revised edition) History of England. It should also begin to take in for periodical circulation, the Monthly Magazine, the Annals of Agriculture, the Oxford Review, and the Journal of Modern Voyages and Travels.

The

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The library to be considered as the property of the subscribers, and of their resident heirs or successors, as long as they shall continue to pay their quarterly contributions within twelve months after they fall due; but any parishioner may, at any time, be at liberty to become a reader of the library on paying 3s. for a single quarter.

N. B. To establish such a library, it seems only to be requisite that a fair copy of this plan should be affixed to the church door, that the clergyman, or parish clerk, should solicit the names of the chief parishioners; and as soon as a dozen have paid their first subscription, the society might be considered as formed. Should any nobleman, or gentleman, lend his countenance to the plan, and contribute a donation of 10l. or 20l. its establishment could scarcely fail to be permanent.

CHAPTER XVIII.

MISCELLANEOUS OBSERVATIONS.

SECT. I.—AGRICULTURAL SOCIETIES.

I HAVE heard of no Agricultural Society established in this county, having, for their object, the improvement of cultivation and live stock ;—for the particulars of the Vale of Evesham Road Society, see the article ROADS.

Many gentlemen of the county are, however, I am informed connected with the Bath and West of England Agricultural Society, which has, most probably, prevented the forming of a similar society within the county.

SECT. II.—WEIGHTS AND MEASURES.

The weights of this county are the same every where else established, (Avoirdupois and sixteen ounces to the pound) nor did I hear of any customs to the contrary.

The measure varies in this county considerably. Mr. Oldacre says, It appears to me to have been caused originally by the quality of the produce of different places

places being different, and one farmer wishing to sell for as much money as another. In the Vale of Evesham, and about the neighbourhood of Worcester, where the quality is fine, the measure used is thirty-six quarts; but on the Cotswold Hills, and in cold climates, as part of Herefordshire, Shropshire, and Wales, it is thirty-eight or thirty-nine quarts; which extra measure hardly makes out for the deficiency of quality, especially in some wet seasons, it being late ripe on these cold lands, thick skinned of course, and seldom dry, or of a good colour.

Mr. Oldacre further gives his opinion, that any general regulation by weight, would be much preferable to equalizing the measure, for several reasons; but a most principal one is, it would be a much fairer way to set the assize of bread from, than from measure; for, it is very certain, that a bushel of wheat in Worcestershire, of the growth of a kindly season, will make, on the average, seven pounds of dough, or six pounds of bread, more than the produce of the same measure in an unkindly season.

SECT. III.—VERMIN,

Considerable injury is done to agriculture, and the productions and fruits of the earth, by various noxious insects and animals; these, as enemies to the subsistence of man, he is bound, on principles of self-defence, to oppose and destroy.

The common red earth, or wire worm, is very injurious to pastures, by fouling them with its castings; and, I suppose, to corn, clover, and other plants, by devouring

devouring the roots, and thus injuring or destroying the plant. I believe winter ploughings, by turning up these insects to the severity of the frost, is a means of weakening or destroying both these and other injurious insects; where land is proper for paring and burning, and a good many ashes are produced, and ploughed in hot weather, a great many worms must be destroyed by these operations; and, I believe, a thorough liming with hot lime, will, by its rendering the earth acrid, prevent their increase, and lessen their numbers. Moles are also natural enemies to worms, and devour them in great number; but cannot be suffered themselves on account of the mischief they do in heaving and hollowing the soil.

Rats and Mice are very voracious, as well as prolific; to prevent their ravages in wheat, it should always be stacked upon staddles, which are easily contracted to keep them out; the use of cats and dogs of the right sort for destroying them, is well known; as also by traps of various sorts, made of wood, steel, iron, &c. with baits. Weasels are of service in destroying these vermin, though a little faulty themselves, as, I believe, the eggs of poultry and young chickens, are not spared by them, and they are great destroyers of game when such prey is in a young and helpless state; on which accounts they are destroyed when they can be come at; when rats are numerous, it is a good way to hunt and harass them with ferrets, by persevering in which, they may be cleared from any premises. Poison is also sometimes employed to destroy them, but this should be done with proper caution to prevent unpleasant accidents.

Moles are very injurious when they too much abound, by heaving and hollowing corn and grass land, and thereby

thereby injuring the crops, as well as giving the land an uncouth appearance ; they are generally destroyed by professional mole catchers, who make a trade of clearing a whole district or neighbourhood.

Sparrows are the most injurious vermin of the feathered race, the most voracious and prolific, and wheat seems their favourite food, in which they do great mischief between the blossoming and ripening, particularly in the neighbourhood of villages, buildings, or high hedges: to prevent their harbouring in the latter, the hedges should always be plashed and laid down round a wheat field, the season after sowing, which also secures the fences ; these birds are also very prejudicial to thatched buildings. Some people have supposed they are of use in destroying insects, but this is doubtful, and this service is better left to swallows and other harmless birds. To lessen their numbers, nets should be used in winter, and their eggs, or rather their young destroyed at breeding time ; to effect which, some parishes or villages give a bounty of so much per dozen upon their eggs, and a higher bounty upon their heads ; but the destroying of these birds is not sufficiently attended to, and, I think, not so much as formerly.

The rook, I believe, does less harm than good, as they are very serviceable in clearing the land of various kinds of worms and grubs which are prejudicial to grain, to clover, and grasses, as well as to other useful plants. They will oftentimes attend a field fresh ploughing up in winter, in large flights, to pick worms and caterpillars out of the furrows, and thus prevent the increase of noxious insects. When other food is scarce, they will sometimes pick up the seed after sowing, or attack a growing crop, but may be kept off on these

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these occasions, by employing a tender with a gun to shoot amongst them.

Pigeons are also useful in picking up divers injurious seeds, but will sometimes make free with a pea crop after sowing and before harvest; they may be kept off by a tender and a gun, and if too audacious may be fired at with hard pease to make them smart; and I think I have seen a good effect in keeping off both this and the last mentioned sort, by hanging up in effigy one or two of their own species in the field where they were committing depredations.

The lark is also sometimes very injurious to late sown wheat, by tracing it down the peeping blade to the grain, and stocking it up with its long heels, and devouring it in this saccharine state; to prevent which, they should be shot at by a good marksman.

SECT. IV.—MISCELLANEOUS EXTRACTS AND REMARKS.

Mr. Carpenter recommends, that one-tenth of all arable land be sown with winter vetches; to this, there is an objection which operates strongly this year, 1807, in the price of the seed, which has been in Worcester-shire from 20s. to 24s. per bushel; two bushels per acre, being 48s., make a breach in the value of the crop; some opulent persons, who had seed of their own, have been tempted to sell it, and sow a less quantity.

The sowing of rye for spring eating is liable to the same objection, when the seed is 7s. or 8s. per bushel, or more; the amount of seed and loss of keep, which a stubble might spontaneously produce, bearing a great proportion to the value of the rye crop for grazing.

On these accounts the sowing of turnips and cole-seed upon early stubbles not seeded down, will be generally preferred, as the seed bears no proportion in value to the former, and I have, this year, seen very good and valuable crops of both, sown early after grain crops.

Mr. Carpenter says, " Sow wheat in the dirt, and rye in the dust ;" this is a Worcestershire idea, founded, I believe, on experience. In the strong land of the Vale of Evesham, they will not sow wheat till the land is well moistened by rain.

From the fall of the leaf till Christmas, he says, is the best time to plant all sorts of trees and quicksets, except aquatics, which should be planted in March and April; also before Christmas is the best time to sow acorns, nuts, cherry or other fruit stones, as well as berries.

Stones that lie in the way, should be picked in the autumn and spring, from off arable land, but not be picked up too clean. Mr. Carpenter says, " They do great service to those lands where nature has placed them, and he has known lands much injured by their being taken off too freely ;" this is a popular idea, and, perhaps, deserving of some attention.

" Wheat (he says) should only be sown very late on warm and rich soils, or where land has been pared and burnt ; the ashes will force the crop earlier. Hedges should be plashed before the end of February, except aquatics, which are as well in March and April."

Mr. Carpenter has proposed, upon worn-out impoverished land, where manure cannot be procured, to fallow for seeds only, and sow such seeds in August ; which, he says, he has done and produced a good grazing pasture, without manure, by the middle of October

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October following, and which continued a good grazing sheep pasture for three years after. If this be correct, it must have been under peculiar circumstances of season or something favourable; as it is generally understood, that seeds then sown alone would not, or but seldom, succeed, even if manured for.—See Mr. Knight's experiment, Chapter VIII. **ARTIFICIAL GRASSES**; where, though the land was only once ploughed, it worked fine and well. A much safer way would be to sow turnips, or if too late for that, fallow on for rye if a sandy, or for wheat if a loamy, soil, and sow grass seeds in the spring; and the crop may be forced by soot, or if not, the seeds may probably succeed. I think the idea of fallowing for seeds alone inadmissible in practice, and should be very doubtful of the success of the seeds.

He also advises to plough up turf land early in August, and to sow turnips upon the one ploughing, to be turnip fallowed the ensuing summer; this may be tried upon a small scale, but I fear the first turnips will seldom be equal to the autumn grazing of the land, after which, it is time enough to give the first ploughing of turf land for turnips. Had not this extra labour better be bestowed on early oat or wheat stubbles, which, if they can be ploughed and sown with turnips in August, often produce a good spring sheep pasture, from the turnips mixed with the shoots of the shed grain?

He lays it down as a leading rule, to sow no grain upon light land, except after turnip fallow. This may be a good rule when such land is foul and impoverished, but when cleaned and manured, and grazed for two or three years, it will certainly admit of one crop before the turnip fallow, and one after, without danger of injuring the land; the turnip fallow managed early, and

and with spirit, will be sufficient to keep such land perfectly clean. A good crop of oats or wheat may be grown on the turf, after two or three years grazing, and the succeeding turnip fallow being well manured with dung, or lime, or both, will keep it in heart; and that this method will turn out more profitable to the occupier, and more beneficial to society, than one crop only, I have no doubt; and the growth of grain is so necessary to the support of man and beast, that no system can be approved where that is curtailed or lessened.

Mr. Carpenter will excuse me for this difference of opinion, as it is from trying different methods, that the best is finally ascertained. The system he proposes, is doubtless adapted to keeping the land clean, but the great object is to render it most productive; and, it must be observed, that one acre of a good crop of grain, and especially wheat, will afford as much nutriment to man, as two acres of green crops, or as four of pasture.

CONCLUSION.

CONCLUSION.

MEANS OF IMPROVEMENT AND THE MEASURES CALCULATED FOR THAT PURPOSE.

DR. NASH observes, the grass land is better managed than the ploughed, which agrees with my observation; also, I think the light land better managed than the strong; the fault in managing the strong land is, an insufficient tillage, especially in the fallows, which often appeared backward, weedy, and slovenly.

If a complete summer fallow is given, the land should be winter ploughed, and worked early in the summer whilst the sun is powerful; the advantage of a sheep pasture in the fallow is nothing, compared with the loss sustained for want of a complete pulverization and destruction of weeds.

WEEDING.

The destruction of thistles and other flying seedlings before they shed their seeds is absolutely necessary to a clean

clean husbandry ; they should be extirpated, not only from arable, meadow, and pasture, land, but also from road sides and hedges ; and I cannot but observe, that, in the neglect of this particular, I had never seen any thing so slovenly, as in some parts of this county.

Docks, thistles, and other weeds, should be rooted out of pastures ; even the scabious and knap weed of some upland cold pastures is very unsightly, and might as well as other improper and useless herbage be weakened by hand weeding.

Draining is wanted, both in pasture and arable land, as well as in common fields ; and though few countries are better in this respect, yet considerable improvement remains to be effected in this way, an improvement than which, when well executed, none is more present or more permanent.

ROADS.

In many of the deep clay soils, the cross roads are scarcely at times passable ; these should be properly formed, well drained, and covered with hard materials. Nothing adds more to the pleasantness and comfort of a neighbourhood, than facility of safe and easy communication ; without which, the conveyance of either manure, or the produce of the land is difficult, unsafe, and sometimes impracticable : the plashing of hedges and sinking deep ditches, with proper outlets, would often do a great part of the business.

COMMON

COMMON FIELDS AND WASTES.

The improvement of these must, I suppose, be preceded by subdivision and enclosure; yet I cannot but think, that improvements might be made in the common field system in their present state; drainage might be effected under the influence of the owners of the land; an earlier and better management of fallows might be adopted; the system of crop and fallow, and that of 1. Fallows, 2. Wheat, 3. Beans, should be altered; and the land should have occasional rest under seeds pastured. Respecting the waste lands, little hope can be entertained of their improvement under the present order of things, without subdivision and enclosure.

ORCHARDS.

The clearing fruit trees of mistletoe, and cutting them down when past bearing for some useful purpose, as well as to clear the land, seem very obvious improvements; yet many old and useless trees are suffered to grow, and others to be overrun with that parasitical weed. The raising of new varieties of superior kinds of fruit, or extending the culture of the best kinds already known, seem objects of great importance. If all the cyder and perry now produced, were equal, in quality, to that from the stire and squash fruit, their value would be increased three or four-fold; and, if the quantity

quantity were so increased, as to supersede, in some degree, the use and importation of foreign wines, it would add, not only to the riches and prosperity of the country where it is produced, but to that of the nation at large.

PROVINCIALISMS.

Of these, an occasional visitor can pick up but few; it requires long residence, and much colloquial intercourse with the middle and lower classes. I observed these pronounced the ay as *y*; thus, *day*, *dy*; *hay*, *hy*; *pay*, *py*; *way*, *wy*; &c. Also the *a* is often pronounced as *o*; thus, *barley*, *borley*; *market*, *morket*; and a boy told me his sister was going to be *morried*.

APPENDIX.

ITINERARY THROUGH THE COUNTY OF WORCESTER.

MONDAY, Sept. 2, 1805.—Down the Stour valley, good meadows, but some drainage wanted ; Staffordshire and Worcestershire canal goes down this valley nine miles in Worcestershire, with nine locks, and a fall of 90 feet to the Severn.—See CANALS. Wolverley; light sandy soil, crops grown, barley, rye, wheat, pease, carrots, turnips, and clover. Harvest finished. Trees in the vale, poplar, willow ; in Wolverley woods, chesnut, oak, ash, whitehazel : Kidderminster, good meadows, and light rich upland ; a large manufacturing town : Mitton, poor light sand, producing rye, turnips, and barley ; very considerable iron works on the Stour, and on a stream called Broadwater, which falls into it, the property of Mr. Knight, Mr. Homfray, and others : Stourport, a new town and port on Severn, arisen in consequence of the above-named canal ; a large depot for coal, iron, and various articles.

September 3, to Worcester.—Hartlebury, deep rich light loam on Grit Stone Rock, harvest cut and mostly got, but some wheat out ; crops, wheat, barley, potatoes in rows, pease, turnips, both as a summer crop and sown on pea stubbles.

Fruit

Fruit trees, both in orchards and hedge-rows; apples and pears only a partial bearing; walnuts a good crop.

Waste land; good light soil on rock; fern and furze spontaneous.

Hedge timber; very fine, mostly elm, some ash, oak in coppices; and in the valleys, aspen and poplar; a very large oak on the road.

Ombersley; rich mixed loam, hop yards, but no produce; turnips sown in hop yards; fruit trees various sorts, both in hedge rows and orchards, but fruit slight and thinly scattered.

Wheat stubbles, ploughing for rye and vetches, beans and potatoes in some orchards; a seat of Lord Sondes's; exceeding fine elm timber in this neighbourhood.

Soil stronger, beans cutting, turnips grown, no wheat fallows here; near Worcester, garden, and plantation ground.

Worcester is principally on the east of the Severn, but has a good many houses on the western bank; the meadows above and below the city extend to half a mile in width, and are rich and of a first-rate quality.

Worcester to Bevern.—Clover mowing for seed, wheat stubbles ploughed for turnips and rye, for spring sheep food.

September 5, Worcester to Malvern.—Orchards, and all sorts of fruit trees; soil deep rich loam, walnuts a crop, apples and pears slight.

Crops grown; wheat, barley, beans, turnips; on the Teme at Powick is a large breadth of rich meadow land: the Teme is navigable but a little way from the Severn, having too much declivity, and being full of shoals and rapids. Dr. Nash observed to me, that Teme, or Tame, seems a name given anciently to rapid rivers;

rivers ; whilst Avon was characteristic of those of smooth and gentle flow : the most remarkable plants observed in this route, are given in a list by themselves.

Very large pear trees, but little fruit ; the sorts here are termed, I believe provincially, the Linton and Barland pear. Beans cut, but some lying on the ground, and some in shocks ; young orchards, and hop yards ; soil, a strong deep loam.

Malvern.—The town stands on the east side of the mountain to which it gives name, and near its north end, as you approach this mountain, the soil becomes colder and later ; wheat, barley, and pease, not harvested, and some growing ; fallows here for wheat, which is also sown after pease ; clematis vitalba in hedges.

To Malvern Well.—Drank the water, which is perfectly clean, pellucid, and tasteless ; I suppose its medical effects much assisted by the pure air and delightful landscape, from its elevated situation, which commands an uninterrupted view into Gloucestershire and Oxfordshire ; the Cotteswold Hills seem near at hand, though 25 or 30 miles distant ; and the Bredon, at half that distance, almost under one's feet. The Vale of Severn, and the greatest part of the county of Worcester, comes under the eye at one view : here are some good hotels, and comfortable lodging-houses.

To Upton on Severn.—A large enclosure at the foot of Malvern has lately taken place, soil cool, fallows for wheat with dung : to Henley ; large orchards cultivated for different crops, stubbles chiefly wheat and barley, turnips grown, and the crops good.

Upton.—Rich meadows on Severn, in which are great numbers of sheep feeding : to Pershore ; beans generally

generally cut and in shocks, and by the stubbles a great crop ; here and there a fallow for wheat, high ridges commence east of the Severn ; wheat stubbles often, but not generally mown, all over the county.

A field near Pershore, covered with fix for what is called watering, (i. e.) rotting the stalk, to separate it from the bark or film : this article is sometimes, but not generally, grown here.

Across Comberton to Bredon Hill.—A common field in Comberton, more attention should be paid to cleaning fallow and destroying weeds ; fallows and corn stubbles foul with weeds ; highways the same : the common thistle shedding its seed, which flies all over the country ; soil, deep rich grey strong loam, ploughed in high ridges, 10 or 12 yards wide, and perhaps elevated two feet above the hollows, but plenty of soil to the bottom of the hollows ; land lost in mears or turf land marks, which are often incumbered with rubbish and bushes. Roads bad, sometimes fenced off to keep travellers within bounds ; sheep of the Cotteswold breed ; rushes in some of the pasture hollows ; near the village, enclosures and fruit trees ; buildings ancient, timber and plaster ; barns of wood.

To the summit of Bredon.—Enclosed with stone walls, sides of the hill good pasture, and large Cotteswold sheep ; tufts of large mushrooms eight to ten inches diameter the largest, sweet and well coloured ; woodland round part of the declivity, the summit rises to an elevation of 8 or 900 feet, and remains sheep walk, but contains a large artificial military work : from this elevation the Vale of Evesham, and the twirlings of the river Avon, seem under one's feet, and Malvern appears close at hand, the hills of Abberley and Whitley some-

what dimmer, and the range of the Cotteswold Hills appear near.

The soil of the declivities, a rich calcareous loam, grass with good verdure, intermixed with the upland burnet (*poterium sanguisorba*,) but some of the knolls mossy and producing furze ; understratum, calcareous stone. This hill occupies a considerable space of ground, standing, I think, upon a base of four or five square miles. The Vale of Evesham, which entirely surrounds it, forms a most picturesque appearance, meeting the eye like a map.

October 1, from Pershore, through the country northward.—Soil, a good grey loam ; modern enclosure, dung and compost laying on bean stubbles, and on clover lays for wheat, and some of the ground ploughing, ridges not quite so high as in the common fields, but 10 or 12 yards wide, and half a yard raised in the middle above the hollows ; rushes often in the hollows ; strong Cotteswold sheep ; wheat and bean stubbles foul with corn, chamomile, and thistles. Barns of wood, houses timber and plaster, some of the roads miry ; found, for about a space of two miles, the wild chicory (*cichorium intybus*,) spontaneous in plenty, the plants grown stalky, but retained its blue flowers. To Upton and Uddington ; wheat stubbles foul with thistles, bindweed, coltfoot, wild carrot, and corn chamomile ; passed a common field whose name I did not learn ; wheat, barley, and oat stubbles, but no clover in them, rushes in the mears, or turf left for land-marks ; enclosed country roads stony, soil strong, in high ridges ; goose tansy (*potentilla anserina*,) abundant, stubbles mown, and often foul with weeds ; on a waste, the thorny rest harrow (*ononis spinosa*,) in abundance,

with scabiosa succisa, intermixed, also betony (*betonica officinalis*,) and yarrow (*achillea millefolium*).

In this route, I must notice one very neglectful slovenly practice; it is very common to find heaps of ditch soil thrown up as compost, which is very good and commendable; but, instead of turning it over with dung to enrich and mellow, it is suffered to remain a nursery for thistles, which, in such situations, in a great number of instances, had ripened its seed, which was dispersing all over the country in the most shameful manner by the wind.

At Uddington are lime kilns, the stone being raised on the spot; but coal for burning it brought from a distance; it is used for manure on turnip land or fallows.

In this tract are several woodlands; pass Newland, a considerable common or waste land in Salwarpe, to Droitwich and Worcester, through a fine, sound, and fertile, enclosed country; on which the management is miscellaneous, no particular system, a good proportion of pasture; hedge rows well stocked with timber; fruit trees and orchards occasionally, gentlemen's seats and plantations: near Worcester a considerable tract of garden and nursery ground, but no hop yards in this district.

October 3, from Worcester along the west bank of the Severn to Stourport.—Country delightful; cherry trees, walnut, chesnut, and orchards, with all kinds of fruit trees; rye sowing on wheat stubbles ploughed up for early spring sheep feed; turnips generally good, some fields of them abounding with the wild mustard, or chadlock (*sinapis arvensis*,) and young sheep turned in to eat them out. Hop yards, village of Shrawley, turnips in hop yards, and wheat stubbles in orchards,

a scattering

a scattering of fruit, and a few hops have been gathered here, in some places none, fruit trees in hop yards, country uneven but fertile. Astley Common, sound land, and good grey-faced sheep. To Bewdley, 4th.— Burley Common, a sound sheep walk, similar to Astley, country sandy, considerable woodlands in sight on the sloping banks of the Severn; Winterdine, a seat of Sir Thomas Winnington's, built on a ledge of rocks over the Severn; pass Bewdley, and the Forest of Wire, a wood land and waste land of great extent penetrating into Shropshire, a cold strong soil on calcareous stone, the wood-land profusely stocked with oak, which is cut down at a certain growth, reserving a proper number for timber trees, and being then stripped of its bark, is sold under the name of black poles, for making rails, laths, hurdles, &c. immense quantities of which are produced in this forest: leaving the forest, cold pasture land continues overrun with *sabbiosa succisa*; road hilly and stony. To Mamble, sounder, dryer, and better land, orchards and hop yards, and an ox team at work ploughing a wheat stubble for rye; turnip grown.

In a dingle, or precipitous valley, near this place, coal has been found, and a work opened for sale, but the vein or stratum is a thin one; a rail-way has also been formed to the Leominster canal.

Towards Tenbury, country rather later; beans in orchards, and some not harvested; seed clover, some not carried; potatoes in hop yards between the rows; large cabbages in others, in a row with the hop-plants; turnips promiscuous.

From Tenbury down the Vale of Teme, a tract of country possessing great fertility, variety, and beauty; its length from above Tenbury, where it enters this county

county out of Shropshire to below Powick, where it joins the Severn is upwards of twenty miles, breadth in the upper part a quarter to half a mile, but in the lower part more; its course downwards is between south and east, with a great variety of windings; it consists of hop yards, orchards, grass land, and corn; the river Teme, which winds through it in all directions, being generally hid and enveloped in willow plantations, the willows sometimes lopped into pollards; in other places at whole length and of vigorous growth.

Pass Lyndridge; hop yards numerous in sight of the road, hop plants sometimes clumped round, but oftener in ridges; some instances of foul hop yards, which are very unsightly; weeds in those cases, wild mustard, groundsel, chickweed, thistle, and were more neglected grasses; more instances of potatoes cultivated between the rows of hops; winter vetches sown in this vale, and now above ground. A large and commodious inn, called the Hundred House, built by Lord Foley, between the Abberley and Whitley Hills, is a great accommodation to travellers.

October 5.—Examined the Abberley Hill, which is of considerable elevation; country round a coldish clay or loam, but fruit trees growing to the foot of the declivities; hill itself, a lightish soil, on loose stone brush (breccia); rabbits burrow on the south side amongst fern; furze on the summit, but good sound sheep walk; plantation on part of the declivities.

The Whitley Hills consist of a cold clay loam on limestone, but carrying a good turf of grass; limestone is raised and burnt here in several kilns, some slight seams of coal having been found in the neighbourhood, of two feet or thirty inches thick, which are worked for this

this purpose as well as for sale ; they are at about twenty yards deep, and the water is drawn by hand in buckets, or in some instances let off by head-ways drawn from a lower level.

Hundred House to Stourport, light sandy soil, turnips, and Staffordshire ploughs.

September 6, and 7, 1805.—Examined the north-east of the county, between Alcester and Birmingham, and between Birmingham and Bromsgrove, and to Stourbridge ; this has no remarkable peculiarities ; the high gravelly or loamy soils bordering on the Lickey, on Clent, and Hagley Hills, are late in their produce, the harvest now in hand ; country fairly cultivated both in corn and cattle, and some very respectable flocks of sheep ; nearer Stourbridge the land is sounder and better, and harvest earlier, being now finished ; but no hop yards, and few orchards, in this district.

The Birmingham and Worcester canal is a good feature of this end of the county, commencing upon a Severn barge scale, at the Wharf, Birmingham, upon a level with the colliery canal, and about 480 feet above the level of the tide ; it passes through hills and over vallies, and enters Worcestershire near Selly Oak upon a high embankment, from thence passing through the parishes of Northfield, and King's Norton, enters Alvechurch upon the same level in the midst of a formidable tunnel of a mile in length, and continues towards Tardebigg upon the same level ; but here its progress for the present stops, and the lockage of 450 feet to the Severn is not yet attempted.

Oct. 8, Worcester to Croome.—Hedges near Worcester hawthorn, smooth woods, bramble, and particularly the Burnet rose plant, (*rosa spinosissima*,) this plant I had never noticed before ; Severn, with its beautiful

beautiful vale on the right, and Malvern, with its numerous and extended jagged summits, very majestically bounds the horizon; blackberries, the fruit of the (*rubus fruticosus*), a very great hit, acorns rather abundant, walnuts the same, orchards with all kinds of fruit trees; hedges full of timber and particularly very fine elm; soil, deep rich light loam; turnips good; seed clover harvesting.

Pass Kempsey; a pleasant village, with many genteel modern built good houses, orchards, but little fruit; wheat stubble carrying off the ground for litter.

To Croome.—Fresh planted fruit and timber trees; cheaply guarded by strong thorns stuck in the ground around them, and tied to them with withes. Croome House and offices are magnificent, and the demesne kept in the highest style of neatness, well watered, and better wooded; soil not rich, often moist gravel or clay, but well drained; the agricultural improvements here are, good roads, draining, and covering an indifferent soil with a good turf, well stocked with valuable sheep and cattle; the other improvements rather belong to landscape gardening, and are neatness and picturesque effect from judicious planting.

As Lord Coventry has in hand a large tract of grass land, well stocked with sheep and cattle, as their numbers increase, instead of being sent to fairs they are disposed of at stated times, annually, or at longer periods, by auction; one of these sales was now, October 8, 1805, for particulars of which, see the article **LIVE STOCK**.

On a considerable waste, on the east side of Croome Park, called, I believe, Defford Common, are good strong sheep of the Cotteswold breed, but some grey-faced sheep.

Pass

Pass Defford and Birmingham; enclosed, good turnips and clover, fruit trees, pastures, and dairy cows, potatoes, elm timber, and excellent meadows on Avon: pass the river over a bridge to Eckington, which, with Bredon, have two excellent common fields; fruit trees about the villages, some ridges a yard high, and 15 or 16 wide, but soil to the bottom; but some broke down and divided, I suppose, for experiment; bean land ploughing for wheat, clover on some lands; good Cotteswold sheep.

In both these common fields are large breadths of turnips and potatoes, which are good crops, well managed, and kept clean, some on broad high ridges, and some on smaller ridges broken down. In Bredon field is also a breadth of the Swedish turnip.

Poor women plucking up bean stubble for fuel, which they have for their trouble; fallows here for wheat, and Cotteswold sheep kept; observed in these fields three kinds of Chadlock as weeds, 1. the common wild mustard; 2. smooth leaved, or wild rape; 3. rough leaved with paler flowers, wild radish. From Bredon field to Tewkesbury, two miles, is all grass land of the best quality.

October 9, from Tewksbury round the south side of Bredon Hill to Evesham.—First two miles Vale of Avon, all at grass, rich land; pass Bredon to Kemerton; enclosed, thence to Overbury, where Mr. Martin, member for Tewkesbury, has a seat, with groves of very fine elm adjoining; through Conderton and Beckford to Evesham, the country enclosed, and a large proportion at grass.

Evesham is on the river Avon, which is navigable here and all through the county; orchards and walnuts plenty; gardens here for the supply of Birmingham,

ham, with large flats of cucumbers, onions, and asparagus; also potatoes and turnips; soil, deep rich light loam.

Northwards towards Norton, and then to Church Lench.—Soil, often cold and poor; common fields to the west; Stone Morton lately enclosed, soil deep red loam; to Inkborough, which has a common field of good sound loam; to Feckenham, enclosed with hedge rows, very full of elm timber, thence through Hanbury to Bromsgrove.

A list of the most remarkable vegetable productions of the county of Worcester, observed in a tour through the county in September and October, 1805, with a few from other authorities.

Veronica hedere folia. Ivy leaved chickweed. Amongst wheat very early in the spring, March, April.

Veronica beccabunga. Brook lime. In shallow streams.

Veronica chamædrys, and *serpylli folia*. Germander, and thyme leaved speedwell. Hedges in summer.

Valeriana disica, and *officinalis*. Wild valerian. In moist meadows, hedge-sides, &c.

Iris foetidissimo. Stinking gladdon, or flag. Great Comberton, and in thickets near Pershore.—
Dr. Nash.

Scirpus romanus. Roman club grass. In marshy places near Throgmorton.—Nash.

Bromus pinnatus. Spiked Brome grass. Rough clayey pastures.

Iris xiphium. Garden iris, or flower de luce. Avon side, near Fladbury, and in other parts of the county.—Nash.

Avena

Avena fatua. Wild oat. In hard tilled corn fields.

Hordeum murinum. Wall barley. Dry banks on road sides.

Dipsacus sylvestris. Wild teasel. Moist hedges.

— *pilosa*. Shepherd's rod. Moist hedge sides near Droitwich.

Scabiosa succisa. Devil's bit scabious. Rough pastures.

— *columbaria*. Small field scabious. Bredon Hill.

Galium mollugo. Tall galium. Hedges.

— *spurium*. Corn galium, or hairough. Corn fields.

— *verum*. Yellow bed straw. In pastures.

Sanguisorba officinalis. Meadow burnet. In meadows.

Plantago major. Broad plantain. Road sides.

— *media*. Hoary plantain, or lamb's tongue.

A variety with variegated straw-coloured stripes grows at Hawford Bridge, near Worcester.

— *lanceolata*. Rib grass. In pastures.

Cynoglossum officinale. Hound's tongue. Hedge sides Shrawley, and other places, in the town of Evesham, on rubbish.

Ditto, variety, *folio virente*. Green leaved hound's tongue. Between Worcester and Pershore, and in shady lanes about Worcester.—*Dr. Nash*.

Symphytum officinale. Cornfrey. In great plenty upon the Stour near Kidderminster, a good pot herb.

Echium vulgare. Viper's bugloss. Road side in the north of the county, a showy flower.

Primula vulgaris. Primrose. Ditch banks.

— *veris*. Cowslip. Meadows, early in spring.
Convolvulus

- Convolvulus arvensis*. Corn bindweed. Corn fields.
— *sepium*. Great bindweed. In hedges.
Solanum dulcamara. Woody night shade. Hedges.
— *nigrum*. Common or garden night shade.
Road sides, and on dunghills, in most parts of
the county.
Campanula latifolia. Large bell flower. In hedges,
— *patula*. Field bell flower. Road sides.
Verbascum thapsus. Great white mullein. Road side
on sandy ground north of Kidderminster.
— *blattaria*. Yellow moth mullein. In the
same situations with the last.
Rhamnus frangula. Smooth buckthorn. In hedges
north of Evesham.
Hyoscyamus niger. Henbane. Road sides, and amongst
rubbish.
Chenopodium bonus henricus. English mercury. Banks,
on road side, near Bromsgrove.
— *rubrum*. Red goose foot. Road sides.
Pucedanum siliacum. Meadow saxifrage. A meadow
plant.
Angelica sylvestris. Wild angelica. Moist hedges.
Conium maculatum. Hemlock. Hedges.
Chaerophyllum sylvestre. Cow chervil. Pastures.
Scandix cefrolium. Common chervil. Hedges near
Worcester.
Cenanthe pimpinelloides, Meadow dropwort. North
side of Bredon Hill.
— *crocata*. Hemlock dropwort. Side of ditches
and rivers; a most virulent vegetable poison,
resembles celery, and sometimes fatally mistaken
for it.
Smyrnium olusatrum. Allisanders. Hedges near Avon
side,

- side, formerly cultivated, but its place now supplied by celery.
- Parnassia palustris*. Grass of Parnassus. On boggy meadows on the north side Bredon Hill.—*Nash*.
- Galanthus nivalis*. Snow drop. Foot of Malvern.
- Colchicum autumnale*. Meadow saffron. Meadows about Malvern.—*Nash*. In the Vale of Severn.
- Allium vineale*. Crow garlick. Vale of Severn.—*Marshall*.
- Vaccinium oxycoccus*. Cranberries. Boggy parts of the Lickey, near Bromsgrove.—*Nash*.
- Chlora perfoliata*. Yellow wort. Stiff clayey pastures about Comberton.—*Nash*.
- Paris quadrifolia*. Herb, Paris. Woods and thickets on the sides of Bredon.—*Nash*.
- Epilobiums* of sorts, in watery places. Willow herbs.
- Polygonums*. Snakeweeds. Moist cultivated ground.
- Saxifraga granulata*. White saxifrage. Hedge bank near Kidderminster, dry pastures Wolverley.
- Dianthus armeria*. Deptford pink. Hedge banks about Pershore, Eckington, and other places.—*Nash*.
- Sedum album*. White stone crop. Rocks of Malvern. — acre. Wall pepper. Roofs and walls.
- Lythrum salicaria*. Spiked willow herb. Moist places.
- Agrimonia eupatorium*. Agrimony. Road sides.
- Reseda luteola*. Dyer's weed. On banks and rubbish.
- Euphorbia amygdaloides*. Wood spurge. Hedges near Worcester, on the Bewdley road.
- Sorbus domestica*. Quicken pear tree. In the south part of Wire Forest, in the parish of Aka, or Rock, near Bewdley.
- Spiraea filipendula*. Dropwort. Upon Bredon Hill, above Overbury, plentifully.—*Nash*.

Rosa

Rosa spinosissima. Burnet rose. Hedge near Worcester, on the Kempsey Road; also on barren waste ground near Church Lench, north of Evesham; a plant of beautiful foliage.

Comadum palustre. Marsh cinquefoil. Boggy places.

Chelidonium majus. Celandine. Hedges in Shrawley.

Papaver hybridum, rhæas, and dubium. Poppies, of sorts in corn fields.

Nymphaea alba and *lutea.* White and yellow water lilies. On the Avon, and other rivers.

Clematis vitalba. Great wild climber. Hedges near Malvern, and North of Evesham. A most exuberant parasitical shrub, twisting round every thing in its way, and hauling down the fences, a troublesome hedge weed; the cottony hairs of this shrub, are said to be employed in France in manufacture, and are recommended here for the stuffing of chairs.

Thalictrum flavum. Meadow rue. Meadows and banks of rivers; meadows on Severn.—*Marshall.*

Ranunculus repens. Creeping crowfoot. This plant is highly esteemed in pastures; whilst the upright crowfoots are deemed prejudicial on account of their stalkiness and acrimony.

Teucrium scorodonia. Wood sage. On hedge banks.

Verbena officinalis. Vervain. Road side Powick, amongst rubbish in the town of Evesham in great profusion.

Mentha arvensis. Corn mint. Corn fields and moist ground.

Glecoma hederacea. Ground ivy. Hedge banks.

Ballotta nigra. Stinking horehound. Hedges in the Vale of Evesham.—*Marshall.*

Marrubium vulgare. White horehound. Road sides, on sandy and gravelly soils at Shrāwley.

Scutellaria galericulata. Skull cap. Side of the Trent and Severn canal, between Wolverley and Stourport, in many places.

Euphrasia. Eyebrights, two sorts. Corn fields and pastures.

Antirrhinum linarium. Toad flax. In hedges.

Scrophularia aquatica. Water betony. Watery places.

Melissa calamintha. Calamint. Woods and thickets near Málvern and elsewhere.—*Nash.*

Iberis nudicaulis. Naked candytuft, or rock cross. In bold stone pits, Pensham field.

Cardamine amara. Bitter cresses. Banks of Avon.—*Nash.*

Syssimbrium nasturtium and amphibium. Water cress and water radish. Vale of Severn.—*Marshall.*

Sinapis arvensis. Chadlock, wild mustard. Corn fields and turnip grounds; three distinct plants are called chadlock by the farmers; which are, wild mustard, wild radish, and wild rape. I found them all amongst turnips, in the common fields around Bredon Hill.

Sinapis alba. White mustard. On the bank of the Leominster canal, by the road side near Tenbury.

Geranium pratense. Crowfoot geranium. Amongst bushes; an ornamental flower, worthy a place in the garden.

Malva moschata. Musk mallow. With the last, and equally specious.

— *parviflora.* Small flowered mallow. Road sides, and often near buildings.

Fumaria

Fumaria claviculata. Climbing fumitory. Rough stony places on Malvern Hill.—*Nash.*

Ononis spinosa. Thorny rest harrow. Road sides, heaths, and rough ground.

Lathyrus nissolia. Crimson vetch. Woody hedge banks near Pershore; a very beautiful plant.

Lathyrus sylvestris. Pea everlasting. In the same situation with the last, near Eckington.—*Nash.*

Vicia sylvatica. Wood vetch. Thicket, north of Bredon Hill.

Hippocrepis comosa. Horse-shoe vetch. South side of Bredon Hill, below the Camp.

Astragalus arenaria. Purple cock's head. Near the above.

Trifolium arvense. Hare's-foot trefoil. On sand in the neighbourhood of Kidderminster, Mitton, and Stourport. If cattle are fond of this plant it might be worthy of trial in cultivation, as it flourishes on the most barren sand in the driest seasons: my horses eat it.

Hypericum montanum. Mountain St. John's wort. About Pershore, and on Bredon Hill.—*Nash.*

Tragopogon pratense. Yellow goat's beard. Vale of Severn.

Hyoseris minima. Small swine succory. Pensham Field, near Pershore, in the most barren and gravelly places.—*Nash.*

Cichorium intybus. Chicory, or wild endive. At Pinvin, north of Pershore, upon headlands by a road side through several enclosures. Introduced into cultivation by Mr. Arthur Young, as food

food for cattle ; its natural appearance is not promising, being stalky and weed-like.

Carduus criophorus. Woolly headed thistle, or friar's crown. Bredon Hill ; road sides elsewhere ; the most elegant British species of this plant.—*Nash*.

Tanacetum vulgare. Tansy. Abundant near the Stour and other rivers ; a warm and not unpleasant deobstruent bitter ; will preserve animal flesh from the fly.

Gnaphalium sylvaticum. Upright cudweed. Rough pastures near Fladbury.—*Nash*.

Senecio paludosus. Bird's tongue groundsel. Near Malvern well by the road side, and on the road thence to Upton.

Inula helenium. Elecampane. Side of Bredon Hill, above Great Comberton.—*Nash*.

— *dysenterica*. Middle flea bane. Road side, on moist ground ; common.

Chrysanthemum segetum. Corn marigold. Cultivated ground.

Matricaria parthenium. Feverfew. Hedge sides, Shrawley.

Anthemis arvensis. Corn chamomile. A common corn weed.

Satyrium viride. Frog satyrion, or frog orchis. Pastures about Pershore and Great Comberton, abundantly.—*Nash*.

Ophrys insectifera. Insect, twayblade, or bee orchis. Rough pastures, Great Comberton.—*Nash*.

Arum maculatum. On ditch banks common. The stem of this plant crowned with a bunch of red berries, remains on ditch banks here to September

ber and October, though an early spring plant; I have not observed this circumstance in Staffordshire, where the plant is common.

Poterium sanguisorba. Upland burnet. On Bredon Hill; on very barren waste land near Church Lench; on rich red loam near Inkborough, and in a meadow near Tenbury; yet not common to be found in the county.

Viscum. Mistletoe. On fruit trees; a bad orchard weed, suffered to infest fruit trees to their very great injury; yet might be easily cut off, or it is said to be easily pulled off by hooks in frost; and is good food for sheep.

Tamus communis. Ladies' seal, or black bryony. Hedges in the Vale of Evesham.

Juniperus communis. Juniper. On barren waste land between Evesham and Church Lench.

Bryonia dasica. Bryony; wild vine. Hedges on sandy or gravelly soil, in the north of the county.

Atriplex patula. Wild orach. Road sides, and on rubbish.

Equisetum's arvensis and palustris. Horsetail. In corn fields, and in bogs.

Osmunda lunaria. Moonwort. North side Bredon Hill, amongst fern.—Nash.

Addenda, 1807.—*Mercurialis perennis*. Dog's mercury. In hedges, between Bromsgrove and Fockbury, an early spring plant, said to be poisonous to sheep, but I believe they will not eat it unless compelled by hunger.

ITINERARY CONTINUED.

In the year 1807, I made several other excursions into, and through the county, particularly in the spring to Brant Hall, in the summer to Lea Castle, Wolverley, Stourport, Droitwich, Bromsgrove, Chadwick Manor, and round the county through the Vale of Evesham, and to Worcester, Bromsgrove, and Stourbridge ; in the autumn, through the west of the county, and the orchards and hop grounds, and to view the stall feeding on the Lechmere estates, which is very considerable, and several times to Mr. Knight's occupation of Lea Castle, Wolverley : particulars of these excursions are incorporated in the different parts of this survey.

Vale of Evesham, August 6 and 7, 1807 ; wild parsnip abundant as a common field weed, also chicory and melilot growing luxuriantly ; soil, deep loam, lammas wheat reaping, crop I estimate 30 bushels per acre, blue cone growing 40 bushels ditto ; in some corn fields convolvulus rather plentiful, a field of set beans five feet high, and a good crop. Bredon Hill, one mile to the right ; wheat lodged or layed by the rain ; here and there a fruit tree in the fields ; mistletoe ; daucus and corn chamomile in addition to weeds before named ; bad farming, and bad crops ; a modern enclosure, some acres of furze on good loam ; older enclosure badly cultivated ; a coppice ; Cotteswold sheep ; horses tied to clover aftermath ; vetches mowing for seed, vetch fallows foul with couch and weeds.

Sedgbury common field ; course, fallow, barley,
beans

beans, wheat ; melilot common ; a tender employed with a gun to frighten crows ; blue cone wheat will here grow a fortnight from August 6, lammas wheat earlier ; beans set by hand, and some a fair crop four feet high, some indifferent and shorter ; chicory plenty, patches of clover mown and carted home, and some tied to ; soil moist loam ; enclosures near the village.

Memorandum in the church yard of Hampton, one mile from Evesham : the upland burnet grows north of the church ; some good crops of set beans in this neighbourhood ; turnips sometimes sown on the lighter loams ; schufflers used.

Arklews, drill machine maker, says, two bushels of wheat drilled, are as good as three bushels sown broadcast upon an acre.

August 7 : viewed Mr. Murrall's farm ; beans drilled by a machine at 14 inches asunder, two rows at a time ; wheat drilled by the same machine, at from seven to nine inches, and barley about the same distance, three rows at a time.

Pease drilled, but had totally missed, they were already harvested, and the crop not exceeding six bushels per acre, sudden rain prevented hoeing, and the weeds grew fast ; the land was undergoing a partial fallow for wheat ; many acres of pease had been cut this season for fodder, being thought not worth keeping for harvest ; the beans in general set or drilled here, none but the greatest slovens think of sowing them broadcast.—See BEANS, Chap. VII.

Near Evesham, good aftermaths of clover, mowing and carting home for horses ; made an excursion to Aldington ; Badsey ; South, Middle, and North Littleton ;

ton; Cleeve Prior, and back to Evesham.—Lammas wheat cut or cutting, the blue cone wheat from seven to fourteen days later, crops good, the former generally four, the latter five, quarters per acre; barley cutting, the crop various, good on sound deep loams, four to five quarters per acre; on wet clays starved, produce about half the above; some orchards here, with corn crops between the trees; under stratum sometimes gravel, but oftener calcareous clay, totally unfit for brick making from that quality. Aldington common field.—Fallow, barley, pulse, (i. e.) beans, pease, or vetches, or clover, then sometimes wheat, or sometimes fallow. Badsey to South Littleton.—Fruit trees in hedges, moist whitish loam, wild plants as before, with the addition of elecampane, wild teasel, and a large bell flower (*campanula latifolia*); under stratum, calcareous flag-stone, very hard in texture, about three inches thick, may be got of large superficies, to four or five yards over; horses tied to vetches almost smothered with weeds (*convolvulus*, *centaurea scabiosa*, *scabiosa arvensis*, corn sow thistle, and *crepis tectorum*) and wheat to succeed; country here enclosed; in hedges, bryony, lady's seal, dogwood, maple, apple, and pear trees, hemlock, and other weeds; good crops of cone wheat: at South Littleton, some fruit trees; reaping Aug. 7; lime burning with coal, at 20s. per ton, or more; quarries for grave stones and floors in various places.

To North Littleton, across the common field.—In which are both barley and wheat drilled, the latter foul with *convolvulus*, and much mildewed, both the white and red lammas; cone wheat less mildewed; chicory, a common corn weed.

Rent of common field land in the Vale of Evesham,
to

to 20s. per acre; of enclosed farms, 80s. to 50s.; of water meadow, 2l. to 5l. per acre: about Middle Littleton, more quarries of flag stone; price at the quarry, 5d. per foot superficial: pass another common field, barley drilled at seven inches and clovered down, crop poor, starved in the hollows, two to three quarters per acre; some of the hollows grass mown, which answers much better than sowing barley; the cultivated trefoil sown here in some places, and the trifolium agrarium spontaneous; some swells of land in these fields light enough for turnips: to Cleeve Prior; the wild carrot, ditto parsnip, melilot, chicory, and convolvulus, very common weeds.

Cleeve Prior to Evesham.—Landscape enchanting, a beautiful view of the river and Vale of the Avon; rich and verdant meadows with sheep and cattle grazing them, and fertile corn fields at a distance on the gently-rising acclivity beyond the river; the road is traced along a high ridge almost overhanging the Avon; landscape to the right a perfect picture, the country seen as a map, with the various and beautiful windings of the Avon up and down for many miles, Bredon appearing on the back ground with great majesty, and the Cotteswolds closing the perspective.

Barley good above this ridge, five quarters per acre, below it a dingle, with the wayfaring (viburnum lan-tana), and the great wild climber (clematis vitalba) abounding.

Uppenham.—Good loam; turnips and barley good, beans and flax grown: return through Aldington common field; wheat drilled at eight inches, barley and clover. Evesham to Worcester.—Great crops of cone wheat. At Fladbury.—Pease and barley carried.

Moorfield,

Moorfield, a common field belonging to about six farmers; system improved, turnips and clover grown, barley a good crop. Bilhampton, a common field near.—Course, crop and fallow, the land being weak, and far from manure; sheep folding in both these fields.

A
TREATISE
ON THE
CULTIVATION OF APPLE TREES,
AND THE
PREPARATION OF CIDER.
BEING A THEORETICAL AND PRACTICAL WORK FOR THE USE OF THE
INHABITANTS OF THE
ISLAND OF JERSEY.

TRANSLATED FROM THE FRENCH OF THE LATE
REV. FRANCIS LE COUTEUR, A.M.
*Rector of Gronville, Jersey, and sometime Fellow of Exeter College,
Oxford.*

Augmentez, propagez les richesses rustiques
-----N'allez pas trop superstitieux,
Suivre servilement les pas de vos ayeux :
Créant a l'art des champs de nouvelles ressources,
Tentez d'autres chemins, ouvrez vous d'autres sources.
Delille, Geor. Franç. ch. 2.



A

TREATISE ON CIDER;

WITH A

SKETCH

OF THE

LIFE AND CHARACTER OF THE AUTHOR,

THE LATE

REV. FRANCIS LE COUTEUR, A. M.

IN perusing a work of merit, the curiosity of the reader is directed to know who was the author, what propensities inclined him to any particular study, what was the tendency of his pursuits, and to what degree of eminence he ever arrived. After contemplating the man in his literary capacity, we feel interested to follow him still farther, and to see him in the less conspicuous, but more amiable, relations of private life. The following Treatise, of which a translation is now offered to the public, is calculated to awaken such a curiosity; and, at the same time that the mind of the reader is warmed with the recital of private worth, it is certainly the most gratifying task to a biographer to extend the fame of a good man, and to pay a tribute to the memory of a departed friend.

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October 1, 1808.

WORCESTERSHIRE.]



A

TREATISE ON CIDER;

WITH A

SKETCH

OF THE

LIFE AND CHARACTER OF THE AUTHOR,

THE LATE

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October 1, 1808.

WORCESTERSHIRE.]

TO

SIR JOHN SINCLAIR, BART. M. P.

President of the Board of Agriculture, &c. &c.

SIR,

YOUR enlightened zeal, which causes rural economy to flourish in Great Britain, excites the applause of Europe; while the former, raised above all other countries by its useful knowledge, reaps the valuable fruits of your patriotic establishments.

The Island of Jersey, which has already been the object of your attention, is scarcely able, from a variety of circumstances, to support its inhabitants two-thirds of the year. To this deficiency in the produce of our fields, may be added the want of manufactures. On the contrary, as the island produces more cider than is wanted for its consumption, it may exchange it for such other articles as it stands in need of.

Your talents, which have carried the breed of sheep, the wool, and the agriculture of the mother country, to a degree of perfection which they had not yet attained, will undoubtedly give new life to the principal branch of industry of twenty-four thousand of his Majesty's loyal subjects, nearly three thousand of whom are in the royal navy and the merchant service. Your kindness in permitting your name to appear at the head of this work secures them your patronage.

While others are founding an ephemeral glory on the wrecks of subjugated nations, may you, when you reckon the number of your days by that of the benefits you have conferred, taste the solid pleasure of serving long your countrymen, and of being beloved by them. Deign then, Sir, to receive this tribute of the profoundest respect of the author.

INTRODUCTION.

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ABOUT the middle of the fifteenth century, cider began to be an object of rural economy in this island. Before that period, mead was the common drink of the inhabitants. Till then, they were unacquainted with the use of spirituous liquors. According to Camden, the Jerseymen of his time had no need of physicians; that temperate and frugal race was seldom exposed to any disorders except agues, which sometimes attacked them about the end of autumn. Wine, which our foreign trade has made so plentiful, and which now extends to the lowest classes of society, was almost entirely confined to the communions of the church.

We may presume that it was the example of the Normans, which suggested to our islanders the idea of cultivating the apple tree, and of extracting from its fruit a liquor equally agreeable and nutritious. By the beginning of the fourteenth century, the former had already transplanted it into their own country, from the province of Biscay, where it grows spontaneously, and often produces without grafting, valuable varieties. (Rozier, tome iii. page 342.)

If the introduction of it into this island was so long delayed, we must attribute it to the difficulty of overcoming old prejudices, and to the circumspection of individuals, who wished to ascertain, by the experiments of many years, the probability of its success, before they ventured to cultivate it on a large scale. But our cider is now our principal produce.* After a

* The exportation of cider from this island to England, Ireland, and Newfoundland, according to the official registers, amounted, in 1803, to 1919 hogheads. Insurmountable difficulties have prevented the author from carrying his researches farther back. Two reasons did, no doubt, contribute to diminish it that year; the former, the great number of strangers, who, on the conclusion of peace with France, having come over, had increased the consumption of all kinds of provisions; and the latter, the renewal of the war, which, during more than half that term, injured the markets.

The exportation of cider	$\left\{ \begin{array}{l} 1804 \\ 1805 \\ 1806 \end{array} \right\}$	to the 1st of Aug.	rose to	$\left\{ \begin{array}{l} 1994 \\ 3227 \\ 3754 \end{array} \right\}$
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These may be valued at one with another, at 30s. a hoghead, so that moderate

Moderate calculation, Jersey produces yearly, on an average, from thirty to thirty-five thousand hogsheads.* Mr. Falle, who published a History of the Island in 1734, and who then characterised its actual produce with the emphatical term of a "sea of cider," made it rise to twenty-four thousand. Since that time, the number of our orchards has increased by more than one-half.

That judicious historian remarked, that, "This vast quantity of cider must be wholly consumed among ourselves, very little being exported abroad, though it be the only produce of the island of which we have an overplus to spare." But now the business of the farmer is no longer to prepare this beverage merely to supply the wants of the inhabitants. An advantageous market presents itself to our speculations; a new career is now open to our industry. The goodness of our gracious sovereign, who has never ceased to seek his own happiness in that of his people, has established our privileges on this fundamental point, and placed them on a level with those of the subjects of the mother country.

It is to be regretted, that the officers at the head of the different military corps in this island, as well as the commanders of vessels of war on this station, should not use more the liquor of the country. I do not pretend to establish that cider ought totally to exclude beer; but I can see still less reason, why it should actually be prescribed from the service; its qualities are not problematical, and, as to its price, it is seldom equal even to that of small beer. By intrusting intelligent persons to choose it good, the commanders might reserve the best for their private use; and thus, by blending their own interest with that of the proprietors, they would form connections with them, which, by a mutual exchange of good offices, could not fail of being beneficial to both parties.

Allowing twenty-four thousand hogsheads for home consumption, the remainder, though manufactured in the ordinary manner, certainly procures us an advantageous trade; but if it was generally of a good quality, and had once acquired some reputation, it is obvious, that it would afford a much more considerable revenue. A precaution which would

during seven months of the last year, that branch of trade has introduced into the country about 5000L.

The reader will not be sorry to be enabled to compare it with the exportation of cows and bulls.

The exportation of cows and bulls	{ 1803 1804 { to the 1st 1805 } of Aug. 1806 }	rose to { 406 cows. 2 bulls. 267 2 428 6 400 9

According to this table, he will be able to judge which of the two is of most importance.

* Hogshead of 60 gallons.

essentially

essentially contribute to increase it, would be, to intrust public officers with the inspection of that which should leave the island. This might suit our police, who are actually bound by law, to take care that no unwholesome cider be retailled within their respective parishes. They might subject every cask on exportation to bear the seal of office, and it might be prohibited, under a heavy penalty, to export any of an adulterated kind.

The extraordinary occurrences of our times have introduced, among all orders of men, a number of artificial wants; and if they wish to be able to satisfy them any longer, they must seek the means of doing it in their own industry.

Pneumatic chemistry, by extending the sphere of our knowledge, has opened a vast field to further observations on the manner of treating liquors. It is therefore probable, that the art of the cider-maker, notwithstanding the high degree of perfection to which it is thought to be arrived, is still only in its infancy. Mr. Marshall, of all those authors whom I have had occasion to consult, seems to me to be the one who has best developed its theory; it is, however, to be observed, that he rather gives an account of what exists in a particular district, than instructions on what ought to be generally practised, and that he embraces many subjects which are remote from our rural economy.

The author, by consecrating to the service of his country the little knowledge which he has acquired in this art, and the cultivation of fruit trees, hopes that some abler hand will remove the deficiencies of a work, the want of which has long been felt among us. These considerations, and a desire of being useful, have dictated the following Treatise.

A TREATISE
 ON THE
CULTIVATION OF APPLE TREES,
 AND THE
PREPARATION OF CIDER.

CHAPTER I.

A general Idea of Cider-making—What Precautions are necessary—And how to Preserve Fruit for the Table.

THE fundamental principles of making good cider, are to observe cleanliness in making it, to keep it in well-seasoned vessels, and to mix no water with it. There may be, however, an exception to this last rule, when it is kept for the use of the family, and is to be consumed within the five or six first months of the year. Even in this case, it is proper not to use well or spring-water, as being too hard, and unable to incorporate itself with the cider; rain and running-water, or even that from a pond when it is clear, are the only sorts fit for that purpose. When one wishes it to pass the summer, or to be sent beyond the seas, it will be proper to observe the following precautions:

In the first place, we should take care, with a view of preserving the blossom for the ensuing year, to avoid the very common practice of beating about the boughs with a pole; by shaking them gently by means of an iron hook fixed to the end of it, the ripe fruit only will be detached from the tree without any thing being injured.

The apples which are intended for cider, should be such as fall of their own accord, or which, on being shaken in the manner just mentioned, detach themselves easily from the tree. They should then be gathered dry, and laid in separate heaps of such varieties as suit each other, in a room having free access

cess to the air, or what is better still, under a shed with a southerly exposure. They ought to be stirred often, and not exceed ten inches or a foot in thickness.

The heaping of them out of doors is attended with several inconveniences. They are subject to be covered with leaves which get rotten in the autumn; they are exposed to the rain, whose moisture they imbibe, and to the frosts which decompose them, and they are also often half buried in the mud. In consequence of all this, they are in a short time deprived of their fragrance, and commonly only afford a poor and watery juice.

As to fruit for the table, a modern author* recommends to make it perspire together for ten or twelve days, before it be put in the fruit room. This method is defective in every point of view. The fermentation which results from it withers it, and shortens its duration; and even when it does not rot it, the effluvia which it communicates from one to the other, inevitably tend to impair it.

After having been gathered with the hand, it should be exposed to the sun for some days, in a room with the windows open; it may be then laid gently on dry fern, and shut up in boxes; it may be wrapped up in paper, and hermetically sealed in vessels of such a size as will allow it a speedy consumption when it is drawn from them; or it may be placed by itself in a room of a moderate temperature, and as little exposed as possible to the variations of the atmosphere. In all these cases it requires to be protected against light itself, the effects of which contribute to impair it.† The only precaution of wiping it occasionally with a dry cloth, and removing what was rotten, would often prolong till the summer a whole some and delicate food, which, according to the ordinary practice, is confined to the first months of the winter.

It would, however, be in vain to protect it against the inclemency of the elements, if it was not also secured against the depredations of rats. An attention to this is essentially necessary in a country, where commerce daily introduces an almost innumerable quantity of those destructive animals; individuals are often deterred by prudential considerations from having recourse to the ordinary expedients for their destruction, yet no one ought to be ignorant of such contrivances whereby he may get rid of them without danger.

In the following chapters I shall lay down the directions which are necessary to be observed in the raising of fine fruit trees.

* Forsyth.

† Light acts chemically on bodies, that is, that it operates combinations and decompositions; one may judge of this by the difference which appears in the same bodies when exposed to light, or when deprived of that element.—Fourcroy, Phil. Chem. Tl. I. No. 4.

CHAPTER II.

Of the Seedling and the Cutting—Of Seeds—Of the Young Plants in the Nursery—And how to Quicken their Growth.

WITH a view to raise fine orchards, one should make use of the seedling. From the very large apple trees, which were formerly to be seen in this island, it is sufficiently plain, that our ancestors had the good sense of not grafting them on any other stocks. I have often observed some of those apple trees in my youth, whose trunks were above two feet in diameter; and an old orchard, now the property of Mr. George Ingomarville, at a place called the Coie, near St. Helier's, can still give an idea of the superiority of that practice over that of propagating by means of cuttings.

The cutting is generally small and badly conformed, being old from its birth, and as a production of art, inheriting the defects of the tree of which it once made a part. The seedling being the offspring of nature, is vigorous and full of youth, and displays in all its appearance the richness and luxuriance of vegetation.

The pernicious custom of cleft grafting on the cutting at six inches from the ground, and sometimes at less, contributes to make it still weaker. This fatal operation seldom fails to communicate the canker to the root, which is already disposed to contract this mortal disease, and this is another reason why the tree should last so little, and should be so often blown down by the high winds.

Such persons as give it the preference, say, that it bears sooner; but this is doubtful. It is, however, certain, that the seedling when come to its full growth, considering its advantageous size, will often give more fruit in one year, than the cutting would produce in many: still it may be remarked, that the deficiency of individual size in cuttings, can easily be made up by their greater numbers. This notion probably draws many proprietors into an erroneous practice, which it may not be improper to examine here cursorily.

Let us suppose that cuttings were planted; double the number of what seedlings would have been, and that each of them should

should in time acquire half the diameter of the latter, which is nearly the case, it is clear, that altogether they would cover only half the surface of what seedlings would have covered. It is a geometrical demonstration, that by taking two equal lines, and dividing one of them into two equal parts, the circle described on the whole line, contains double the sum of the other two circles, which are described on the parts of the other line; but when it is considered, that the seedling raises itself to more than twice the height of the cutting, their relative proportion is no longer to be calculated by the area of the circle, but by the cube of the whole. Taking it then for granted, that the seedling and the cutting are equally fruitful, (a fact which I believe is not contested) the former must carry it over the latter as to the quantity of its fruit, in the proportion of more than four to one.

The same gradation is nearly observable between the seedling and cutting, as between the wild pear and the quince. Some pears of the mellow sorts succeed better on the latter, and perhaps some sweet apples would acquire more flavour on the cutting; but this is an experiment yet to be made, and which has more reference to fruit for the table than for cider; and until the fact be ascertained, it is better to procure the one and the other from the seedling. It is seldom that the English and Normans plant apple trees, which have been grafted on a cutting; nevertheless, their nurserymen cannot be ignorant how easily it may be propagated; but they know, that if they did it, they would lose the confidence of the public, and be deprived of their customers.

If, after all, contrary to the evidence and practice of the most enlightened cultivators, some persons should still persist to allow this unfortunate plant room in their orchards, let it be at least confined to low grounds; it is rather better adapted to such places than to any other.

It may be asked, how it has been possible to spread a prejudice so contrary to the first principles of nature? Perhaps the following causes have contributed to it: It is because the cutting requires no further management than that of digging the ground where it is to be planted in the nursery; it is also because it is strong from its first year, and scarcely wants more than half the time which the seedling would take to develop itself. These advantages, together with its being cheaper, have made it an object to those cider growers, who, reckoning the beauty of their orchards as nothing, and rather calculating the number than the quality of their apple trees, think they are truly economical, because they are put to less expense. The plausibility of a thing has always afforded a defence of errors, and under such auspices one may well conceive how this particular one was disseminated from one neighbour to another. Be it as it may, this practice must be classed with some of those unfortunate prejudices, through which routine is become stronger than reason, and has, for some years past, among us, got the better of our true interests.

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The finest and best grown seeds ought to be selected, as the elements of plants are of the highest consideration with respect to their future progress. These may be sown in the end of autumn, or in the beginning of spring. Those of a crab stock are preferable; but such as are procured from a foreign country, or a severer climate, are better still.*

The second winter following, the plants may be taken up, and after selecting the strongest, they may be transplanted in a nursery about three feet from each other, which has been previously well dug. The ground must be ploughed up at least twice a year, be kept entirely free from weeds, and no manure is to be used. It will not do them any injury to raise between the rows those vegetables which draw principally their nourishment from the atmosphere, as French beans, onions, lettuces, &c. but all such as strike deep roots ought to be rejected.

So far from its being a disadvantage, it is a favourable circumstance, when at this time the young plants throw out from the root or foot one or more shoots. Unless the stem be very fine, one must take good care not to destroy those shoots, as it is commonly done. After selecting that which promises best, it may be substituted to the stem about the end of the second winter, which is then cut off. As it is perfectly smooth it raises itself vertically, and becomes more vigorous in one year than the stem would have done in many. This shoot is a favourite of nature, but almost all the gardeners and nurserymen of this island consider it in all cases as an intruder, and make it a point to destroy it; about one-fourth of apple and pear trees admit of this operation. There are several other species of trees subject to the same laws. As the sap decidedly takes a perpendicular direction, it will be easy in general to excite a rough or stunted young stem to put forth lateral shoots; the only requisite being to bend it down.

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THE art of grafting is one of those fortunate discoveries, from which we derive in this northern climate one of the most agreeable sensations that flatter the taste; and it is a process by which a graft or bud is joined to a tree, which by developing itself there, changes, and most commonly improves, its subsequent produce.

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It is not my design to describe here the manual process of grafting, about which information may be easily procured from writers on gardening. I shall merely observe, that when the graft is placed on the chief boughs, it occasions less derangement to the vegetable economy, than if it was on the trunk, and that the wood of the stock, being naturally closer than that which springs from the graft, is better able afterwards to resist the high winds, and bear the weight of the fruit.

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According to me, it is a much more essential point, that the grafts should be taken from the lower branches, and the south-westerly aspect of a tree which is sound and fruitful and of middle age. The best grafts are well grown shoots of the preceding year, not very long, and with the buds lying close to each other. The buds from the fourth to the eighth, are for the most part the finest. Two of them are sufficient; a greater number requires too much nourishment from the stock, and might occasion a failure in the process.

One should not graft a whole nursery indifferently; as the individuals, though they are of the same species, put forth their shoots at different times; one must take care to join together those varieties which are analogous to each other. Never did the graft of an early sort, strictly speaking, thrive on a late stock, nor a late graft on an early stock. The plants may be classified in the preceding spring, that one may be the better able to unite them afterwards in a manner conformable to their nature.

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It is good not to be too hasty in suppressing the shoots which come out near the graft or bud ; this should be put off till the sap, by working a passage into the adoptive channels, has decidedly secured to the graft the nourishment of the stock. A contrary practice very often occasions the loss of the one and the other.

There is an expeditious method of increasing the number of many sorts of trees, which is, in the beginning of spring, to make a strong ligature round one of the well grown shoots of the last year, and, if possible, just above a nodus or smutty excrescence, taking care to cover the ligature sufficiently with a composition of fat earth and cow dung. The strangulation, by causing a swelling and intercepting the course of the sap, obliges the shoot to strike root that very year. In the autumn or the next spring, it is separated from the parent plant, and thus this process is neither attended with the risk or the delay of grafting.

It is said that the Chinese have a practice very much like the above. They surround the lower part of a bough with a quantity of unctuous earth, and then suspend a jug of water, which, by dripping over it, keeps it moist ; the bough then strikes root in the earth, and is fit to be cut and transplanted the next winter.

One may, however, conclude, that trees raised in this manner, are in some measure cuttings, and must necessarily partake along with them of the same disadvantages.

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IT is plain, from the circumstance, that nature renders those trees more vigorous which have not been removed; that one cannot be too careful to preserve the roots of such as are transplanted. In taking them up one should dig in a direction parallel to the roots, for by doing it crossways; or at right angles; one is in danger of mutilating them. When the roots have once been laid bare with the spade, a pitch-fork will be very useful in disengaging them from the earth, without doing them any injury.

One may conceive, from the analogy which exists between trees and annual plants, that as transplantation accelerates the maturity of the latter, and makes them run up to seed sooner than they would have done otherwise; it will also have a beneficial influence on the former, by making them produce fruit the sooner. This fact has been confirmed by experience.*

As to the pits, it is proper that they should be dug for some months before planting, and that they should be sufficiently large to give room to the roots to spread themselves. The earth of the surface must be set apart, so that it may be put back in its place whenever it will be necessary. In all level grounds the tree should not be planted deeper than it was in the nursery, or not even so deep, considering that the ground will afterwards sink in. The roots being deprived of the beneficial effects of the atmosphere, by having been planted too

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When it has been fixed in its new residence, tread down strongly against the roots the earth, which in digging the pit had been taken from the surface, or else substitute mould instead of it; if, on the contrary, it is a heavy soil, it must be lightly trodden. In case the season should be advanced, and there would be reason to expect a continuance of dry weather, you will throw into each pit, at the time of planting, a few bucket's-full of soft water. When the roots of a tree have suffered, either by carelessness in taking it up, or by having been kept too long out of the ground, it will be proper to prune them to the quick, and in the latter case, to steep them in soft water for some days before the tree is planted.

Whoever will take the trouble to examine the trunk of an old tree which had never been transplanted, when cut horizontally, will perceive that the portions of heart and sap are thicker on the southern than on the northern side. This is a convincing proof, that it is an object of some consequence how to give trees properly a southerly exposure on transplantation. For this reason, I prefer to insert the graft on the northern side, as I find that it covers again the wound of the stock the sooner.

I remember to have observed, among other trees, three alders which grew near each other, and had been cut down close to the ground; the first of them measured thirty inches in diameter, the second twenty-four, and the last twenty-one. The strongest of them had twenty inches of wood from the heart to the circumference, on the southern side; the other, sixteen; and the third, fourteen. These instances afford a remarkable coincidence, and I doubt whether many of the kind could be found; but they prove at least, that in this island, nature has made itself a law of a principle, that is to say, to nourish the wood a great deal more on the southern than on the opposite side. It is, then highly probable, that the derangement occasioned in a great number of trees by not attending to this particular in transplanting them, especially such as are come to a certain degree of strength, checks and stunts their growth, and very often destroys them without the cause being so much as suspected.

Some time ago, a friend of mine shewed me three fine chau-montel pear trees on espaliers, which had been transplanted in his garden the preceding winter, two of which were dead. He did not know to what to attribute their loss, as he assured me they had been taken up with the most scrupulous attention. I enquired

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When it has been fixed in its new residence, tread down strongly against the roots the earth, which in digging the pit had been taken from the surface, or else substitute mould instead of it; if, on the contrary, it's a heavy soil, it must be lightly trodden. In case the season should be advanced, and there would be reason to expect a continuance of dry weather, you will throw into each pit, at the time of planting, a few bucket's-full of soft water. When the roots of a tree have suffered, either by carelessness in taking it up, or by having been kept too long out of the ground, it will be proper to prune them to the quick, and in the latter case, to steep them in soft water for some days before the tree is planted.

Whoever will take the trouble to examine the trunk of an old tree which had never been transplanted, when cut horizontally, will perceive that the portions of heart and sap are thicker on the southern than on the northern side. This is a convincing proof, that it is an object of some consequence how to give trees properly a southerly exposure on transplantation. For this reason, I prefer to insert the graft on the northern side, as I find that it covers again the wound of the stock the sooner.

I remember to have observed, among other trees, three alders which grew near each other, and had been cut down close to the ground; the first of them measured thirty inches in diameter, the second twenty-four, and the last twenty-one. The strongest of them had twenty inches of wood from the heart to the circumference, on the southern side; the other, sixteen; and the third, fourteen. These instances afford a remarkable coincidence, and I doubt whether many of the kind could be found; but they prove at least, that in this island, nature has made itself a law of a principle, that is to say, to nourish the wood a great deal more on the southern than on the opposite side. It is, then highly probable, that the derangement occasioned in a great number of trees by not attending to this particular in transplanting them, especially such as are come to a certain degree of strength, checks and stunts their growth, and very often destroys them without the cause being so much as suspected.

Some time ago, a friend of mine shewed me three fine chau-montel pear trees on espaliers, which had been transplanted in his garden the preceding winter, two of which were dead. He did not know to what to attribute their loss, as he assured me they had been taken up with the most scrupulous attention. I enquired

enquired then, if he had taken care to give them the same exposure they had before. I was told that the one which was living was so planted, and that those which were dead, had been placed in a contrary direction.

It is difficult to say, whether trees should be transplanted in the winter, or in the spring. This question is to be decided from the nature of the soil, the species of the plant, and the situation where one wishes to fix it. The former of these reasons is, in general, better adapted to dry and high places; the latter, to low and wet grounds.

There are places where the soil is totally contrary to vegetation; and others, where its sterility exists only in the inferior strata. In a marshy situation it will be requisite to make a drain to carry off the waters, and in the other above-mentioned cases, to dig large pits and fill them with good earth. As high grounds are liable to give way and sink, and low ones to rare themselves, the trees on the top of declivities must be planted deep, while those in the vales need not be much below the surface. Those in intermediate situations must be set in proportion to the degree of declivity. As the roots of the cutting do not strike deep, they must be planted deeper than those of the seedlings.

A composition of cow dung, clay, and wood, or sea-weed ashes, in the proportion of weight of 3, 2, and 1, in the order I mention these articles, being diluted with urine and soap-suds; and applied in a rope of twisted hay round the young plants, nourishes them, and protects them against field mice and rabbits, and guards them against the effects of frost, and the other inclemencies of the weather. When they are secured with either thorn or furze, it prevents the cattle from doing them any injury. The spring is the proper time to remove this covering, when the trees are become strong enough to dispense with it.

The violence of the high winds is liable to shake them, but a few stones heaped up round their foot will keep them steady. They are preferable to props, as they allow the trunk to move itself gently, and do not occasion any stagnation in the sap. They have, besides the salutary effect in a light soil of making the earth lie closer on the roots, and by restraining evaporation, of keeping them fresh during the summer. There is no reason why the field should not be sown the same year that the trees are planted. The crop may grow equally on the whole of its surface, care having been taken after ploughing, of covering the stones with earth in the shape of a small tumulus.

It is desirable that the circulation of the sap in the vegetable, as well as the secretion of fluids in the animal economy, should be made elaborate by exercise. This is the cause that the fruit of standard trees, when it comes to maturity, has more flavour, than that of the same kind which has been grown on espaliers; this circumstance being striking in the warmest climates. The circulation of the sap in the trunk of trees which

which have been recently planted, having been slackened, it wants, especially at this period, to be gently excited by motion.

It is principally to these three causes, namely, the use of the above composition, the stones, and the motion, that I attribute the preservation of one of my orchards, which consists of thirty-six apple-trees. Although it had been planted in the spring of 1803, on a high gravelly ground, and exposed to the sun heat, it withstood, without being watered, the heats and the drought of the next summer, which was remarkable for the intensest of the one, and the long continuance of the other. I lost but one foot, while, with some of my neighbours, more than half failed.

CHAPTER V.

Of the Shoots which grow below the Graft—To what Height the Trunk of Apple Trees ought to be suffered to Grow, and how to Plough among them, to Manure, and to Prune them—Of Forsyth's Composition for Curing the Wounds of Trees—Of its Qualities with respect to Grafts—Of Miller's Composition for the same Object, and how to simplify it—A Remedy for Decortication.

It is indispensable to suppress the shoots which grow below the graft. They would otherwise consume the sap to no purpose, and make it abandon that precious deposit of art.

The trunk of apple trees, especially of such varieties as are subject to bend down their boughs, ought not to be less than six feet high, so that they may be safe against any injury from cattle. The fruit undoubtedly suffers a little in consequence of this height; but the beauty of the plantation, and the better quality of the grass, equally recommends a practice which obviates the necessity of cutting the large boughs, as one is but too often obliged to do, when the orchard is to be cultivated, and which thus essentially tends to its preservation. The apple trees may be allowed to be lower, when the ground will not admit of being ploughed, as the denseness of the air, and the reflection of the sun-beams, will then contribute to improve the fruit.

Plough the ground among the trees, but not deeply, and let the manure be put at a certain distance from the foot, as a contrary practice would make them decay. It will add to their strength by retrenching the superfluous branches. Without this precaution vegetation exhausts itself to no purpose, and all the parts of the trees are thereby visibly impaired. The branches must be gradually thinned. Two or three years are not too much for dressing trees of a middle age, which had not yet been pruned. As to the old ones, it is no longer time to perform upon them this operation, as it would be dangerous to turn out of its usual course the sap, which is ready to be dried up of itself.

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The praises which have been so liberally bestowed upon Forsyth, seem to place beyond all doubt the efficacy of his composition for curing the wounds of all sorts of trees. The work, in which is contained the receipt for making it, has been recently published; and is scarce and dear. Either of these circumstances would be sufficient to deprive those of its information, who are most interested in possessing it; and here it may be worth while to enable them to avail themselves of a discovery which is considered as very valuable.

A tree, which, according to Forsyth, has hardly any thing living but the bark, and which, if left to itself, would linger on, and die in a short time, may not only recover after his method within three years, but grow, during that period, and be restored to its former luxuriance. It is easy to conceive, that though it may have been very much mutilated, it may be preserved by being treated in the same manner. The process consists in removing the diseased and unsound parts by cutting to the quick with a sharp knife, and then immediately applying the above composition with a brush to the wound.

This composition, (says the author), is preferable to the mixture of clay and cow-dung, which is used in grafting. My experiments in this respect, have not been successful, as not one out of more than two dozen has succeeded. In fact, its calcareous causticity, cannot fail of absorbing the moisture which is necessary to the union of the graft and the stock; and, in my opinion, it is precisely this very quality, which makes it so serviceable in curing the wounds of trees.

It is a pity to see prejudice triumph over ingenious inventions. The mixture of turpentine, wax, and rosin, the use of which was so strongly recommended by Miller, the oracle of English gardening, (Gard. Dict. Art. GRAFTING.) has now remained buried in oblivion for more than half a century. I have substituted instead of it, one more simple, by combining with a given quantity of rosin, about one-fourth part of tallow; this mixture has the advantage of cleanliness, expedition, and cheapness. It must be moderately melted on a chafing dish, and then applied with a wooden spatula or spoon to the grafts; it will completely defend them against small worms, and the effects of the sun and the frost, and the other inclemencies of the weather. I have now used it for a long time with complete success. It is worth while to inform the reader, that when this mixture is warmed often, it will be necessary to add more tallow occasionally; as otherwise it would be subject to fall off in scales, and sometimes to detach itself entirely, and thus make the graft fail.

The following is the substance of Forsyth's receipt, which, besides other advantages, has procured him a grant of 6000*l.* from the parliament of Great Britain.

Take a bushel of fresh cow-dung, half a bushel of the rubbish of old buildings, (that of ceiling is preferable), such as old slackened lime and chalk, half a bushel of wood ashes, and the sixteenth part of a bushel of sand from a quarry or a river.

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These three last ingredients must be well sifted before mixing them. Incorporate the whole together with a spade, and then beat it with a flat board, till the composition being well diluted be rendered as fine as plaster for ceilings.

Reduce it to the consistence of paint rather thick, by pouring upon it a sufficient quantity of urine and soap-suds, and apply it in that state; sprinkle then upon it wood-ashes mixed with a sixth part of burned bones pulverised, out of a tin box in the shape of a pepper-box, till the surface be entirely incrusted with it. The spring is the most favourable season for this operation. It will be proper to examine the application from time to time, to repair it in case it should have fallen off.

There are but few individuals who want to provide themselves with so large a quantity of this specific. With a view to reduce it according to exigencies, and to facilitate the making of it, I will give an account of my own process.

I got sand from a quarry, and whiting, to be ground in the same manner as is done for paint; I had them both sifted, as well as the ashes, and each of them put separately; afterwards I had a glass full of sand emptied into a large pail, adding to it eight times as much whiting, eight times as much ashes, and sixteen times as much cow-dung; these ingredients were then mixed together with the hand, till they were perfectly incorporated, and laid by in a vessel on purpose. The quantity which is occasionally wanted, is drawn from it, and diluted with urine and soap-suds. I have followed the same proportion about the ashes and pulverised bones, having mixed them together in a bottle by shaking it, as I filled it gradually.

In case some of the bark of the trunk should have been taken away, the piece itself may be replaced, which method, I believe, was first contrived by Mr. Bucknall; the bark of another less valuable part of the same tree, or even that of another of the same species, may be substituted, and in both cases, the wound having been previously well cleaned, it must be adjusted to it, and laid even with it in its whole circumference, and kept close to it with a strong ligature for three weeks or a month; the wound is then so perfectly cured that there hardly remains any scar. The only disadvantage I know of, attending this remedy, is, that it cannot be practised but when the sap allows the bark to detach itself from the wood.

CHAPTER VI.

At what Distance Apple Trees ought to be planted—The Author's Rule—That of Miller—Inferences drawn from the Perspiration of Trees.

IT is an error to plant too closely, as the same effects result from it for the whole, as for the individual. High grounds which want shelter, and declivities which are unfit for the plough, are nearly the only places calculated for such a practice. The best rule, in my opinion, for grounds advantageously situated, is to place the apple trees in the form of a ring, allowing but one row round a middle-sized field, and to have them at the distance of two perches and a half from each other.

Miller thinks that a distance of a hundred feet is not too much; the following are the reasons with which he supports his opinion:—"It may, perhaps, seem strange to some persons, that I should recommend the allowing so much distance to the trees in an orchard, because a small piece of ground will admit of very few trees when planted in this method; but they will please to observe, that when the trees are grown up, they will produce a great deal more fruit than twice the number of trees, when planted close, and will be vastly better tasted; the trees, when placed at a large distance, never being in so much danger of blighting as in close plantations, as has been observ'd in Herefordshire, the great county for orchards, where they find that orchards so planted, as that the air is pent up among the trees, the vapours which arise from the damp of the ground, collect the heat of the sun, and reflect it in steams so as to cause what they call a fire blast, which is the most hurtful to their fruit; and this is most frequent when the orchards are planted to the south sun."

The perspiration of trees, especially when they put out their leaves, is a fact which has been known for a long time.* The effluvia, or attenuated substances, which they exact, and

* Ingenhouse, Duhamel, Rozier, Massim.

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which excite in us the sensation of smell, show that these particles, which may be considered with regard to the tree as feculent matter, sometimes extend their influence to an astonishing distance.* Nature, by rejecting them, plainly proves that they are baneful to vegetation. On this account, trees which have been planted by themselves in a favourable situation, have almost in every case a finer appearance, and their timber is more perfect than that of such as grow in forests. Whenever any of the latter acquire strength, they cause the contiguous ones to perish, that they may at the same time find room to extend their roots and get rid of the effluvia which incommode them. A clump of trees will often shoot up to a great height; the reason is, that the trees being in part deprived of nourishment of the atmosphere, hardly receive the light but at top; this element being equally necessary to their own growth, and causing the greenness of the leaves. But this portion of light not being sufficient to keep them healthy, they gradually decay, the lateral branches are withered up, and the trunk, by being deprived of the genial influence of the sun, becomes weak and slender.

But to draw some inferences from the principles which we have just laid down:—The more the boughs are liable to bend down and assume a horizontal direction, as is commonly the case with those of the apple tree, at the greater distance ought the plants to be placed from each other. By such a practice they are more exposed to receive the mild heat of the sun, and to enjoy a wholesome air, and their fruit ripens better. The grass under is of a better quality, and when the ground is sown for grain, it produces better and more plentiful crops. There is also another advantage attending it, which is, that when the trees have got old, and yield but an indifferent produce, an orchard may be replanted without any inconvenience, by placing the young trees between every other of the old ones, and in a few years be renewed.

* We are assured by voyagers of credit, that in their passage to the East Indies, they have distinctly smelted the aromatic scents of Ceylon at the distance of more than fifty miles.

CHAPTER VII,

Of the Soil and Exposures most favourable to the Apple Tree—A Conjecture how to procure Fruit every Year—How to destroy the Moss and Insects.

IT is the opinion of many experienced growers, that the soil favourable to broom (*genista*) is in this climate that, which is best adapted to the apple tree. A poor, dry, and gravelly, soil, improves the nature of the fruit; and what is lost in quantity is more than amply made up by the quality.

By distributing the trees in a variety of situations, it is possible to secure crops at very different periods. Often will it be a plentiful year in one spot, when, in consequence of the ordinary variation of the seasons, there is a failure in all other situations. Though the apple tree agrees well enough with most situations, provided it is sheltered from the sudden gusts of high winds, yet a south and south-east aspect are the best exposures for an orchard; this is what is almost always to be seen on the slope of a sheltered hill, where one has taken care to plant such varieties as blossom late; there the spring sun dissipates, in a short time, the dews and fogs of the morning, and the atmosphere warmed by its refraction, sheds for the remainder of the day a gentle heat, and for a long while preserves the tender tissue of the blossom. The east wind, being dry, and seldom violent, co-operates till the season is further advanced, to retard, by its chillness, the formation of fruit.

It is not generally desirable, that the crops should be very plentiful, as, besides that they are inferior in price, and almost always in intrinsic value, it is then that the grower is drawn into most trouble and expense; it is then his interest to endeavour to procure moderate ones each year. Might he not be able to gain this point by putting off the produce of the apple trees? I think that this is not impossible. The flowers which adorn our garden shrubs in the spring, may be delayed till the autumn. The rose bush which scatters around its fragrance in the former season, if it is deprived of its leaves, it will reserve

it for the latter. This takes place, if I am not mistaken, with respect to the fruit of the raspberry; some varieties of that plant bear spontaneously in autumn, and I think that all might do the same with proper care and attention. Nature is attentive to the different species, and never ceases to occupy itself with contriving the means of their re-production. By destroying the blossom of a plant, which, like the apple tree, most commonly bears every other year, might it not be possible to put back its crop very often to the subsequent year? I conjecture it; I do not dare to warrant it, having not yet made any experiments of the kind.*

Happily the mistletoe, which is so common among our neighbours, has not yet shown itself upon our trees;† they are, however, attacked with the moss, which does them an infinite deal of harm; the cutting, as being weaker, suffers more than the seedling. It may be destroyed by throwing, in damp winter weather, wood or sea-weed ashes, or pulverised quick lime, over the branches; by washing the trunk with fresh lye, such as is used in washing, and after it has been laid on with ashes, by cleaning it with a coarse cloth or a handful of straw. In this manner the trunk becomes perfectly smooth, and the insects perish which were lodged in the external crevices and gnawed the bark, together with the eggs which in the spring would have produced some other insects. It will be sufficient for the most part, to repeat this operation once every three or four years.

The lye, being rendered more caustic by being boiled with quick lime, in nearly the same proportion as that of ashes, when injected with a garden engine into the branches of the peach tree, destroys the *aphis*. This operation, when performed about the end of autumn, annihilates the future generation of that destructive insect. This may be done on all sorts of trees, and, it is probable, that the birds most often attack the young buds, but with the view of feeding on the grubs which are lodged in their tender cellulas.

* I hope the reader will indulgently receive these conjectures, as they have no other object than the advancement of rural economy, even if future experiments should demonstrate them to have been erroneous. From the increase of value in our orchards within these few years, they may now be looked upon as the chief and most important part of our landed property. Besides the advantages we derive from the cider, the traffic in apples and pears already gives room to expect the most favourable results; may then such powerful and interested motives determine our farmers to concentrate their industry on these solid bases, rather than buoy up themselves with the hopes of speculations foreign to their situation in life, and at all times doubtful, but which, at the end of the war with the continent, would infallibly be overturned in the course of a few weeks!

† After the publication of this work, the author discovered one solitary instance of the mistletoe in the island, but this can hardly invalidate the assertion in the text.

CHAPTER VIII,

Of the Pear Tree for Perry—Remarks on the Cultivation of Peach Trees, &c.

FROM the many fine pear trees of the perry sorts, which are scattered here and there in our fields, it is probable, that in most districts, they would succeed perfectly well. Without pretending to exclude the cultivation of apple trees, that of pear trees would have its own advantages; 1st, That its produce is more regular, and that the varieties proper for perry are highly esteemed; andly, That the liquor is sooner fit for use; 3rdly, That the pear tree commonly bears when the apple tree fails; 4thly, That it lasts at least three times as long; 5thly, That though it be generally larger, it withstands the winds better; 6thly, That fogs, high winds, and hoar frosts, seldom injure its blossom, and that there is hardly any thing besides hail that hurts the fruit; 7thly, That, finally, by this means old orchards may be renewed, when the soil is exhausted for apple trees.

Plants seldom or never succeed when they replace immediately others of their own species. Nature seems to have prescribed this law to trees as well as to garden vegetables.*

* It is, perhaps, as much owing to the exhausted state of plants as that of the soil, that the small bulk of most of our oaks is to be attributed. It is probable that the inhabitants of this island, have, time out of mind, confined themselves to raising the indigenous sorts. It is, however certain, that in England and France, where, from the extent of those countries, the numerous varieties of this kind are better able to cross themselves, the timber grows infinitely stronger. I cannot attribute to any other cause this effect, which is so striking in an intermediate country like this, where the soil, the situations, and the shelter, seem to offer all that is requisite for the most ample display of vegetation. Proprietors then who interest themselves in the improvement of timber, and the well being of future generations, will sow acorns, and transplant select young oaks from foreign countries, with the view of retrieving among us the majesty of that monarch of the woods. There exists, in this respect, a perfect analogy between the

There is a remarkable instance of it in peach trees on espaliers. When they are planted in good and new grounds, they are for the most part luxuriant and fruitful; while on the contrary, those that succeed them become stunted, and scarcely bear any thing. This is the case, more or less, with all old gardens. It is to be supposed, that this defect arises from the species itself.

As trees are a genus, they contain many species, which, by appropriating to themselves their own suitable support, may come to perfection one after another, in the same manner as the different sorts of grain, when varied with judgment, successively produce plentiful crops for several years in the same field without additional manure.

"It is by the adoption of this advantageous practice, (says the author of Annotations on the French Georgics), that the Flemings, the Brabantese, the Swiss, the Alsatians, and, above all, the English, have raised their agriculture to a degree of perfection unknown to the rest of Europe; that they have been able to raise, one after another, on the same soil, and always with success, a great number of vegetables of different species and natures, and have established a course of crops as the basis of rural economy."

It follows then, that peach trees may very properly replace each other, provided the one has been budded on the plum tree, and the other on the almond, or *vise versa*; because it is the stock, on which the graft has been intrusted, which sucks up from the earth the juices with which it supports it. Peach trees may be grafted upon each other, or on the apricot, the plum, or the almond; the latter two are generally preferred, principally, I think, because they are stronger: the English choose the plum, and the French the almond. The inequality between them, is, in all probability, not very striking, unless it be owing to the climate; a consideration, which, in this intermediate country, cannot have much weight. It is also well known, that the plum tree throws out lateral roots, and that the almond is top-rooted; and thus, when the soil is exhausted for the former, it is in some measure new for the latter. By planting the almond after the plum tree in the place intended for the peach, it will establish a still more decided difference in the relative characteristic of the roots of the two stocks. The almond, which has not been transplanted, will then shoot its roots deeper, and a luxuriant vegetation will lay the foundations of a future plentiful produce.

The almond, when budded in the month of August, or sometimes later, succeeds better than at an earlier period; the sap being then too abundant, is liable to drown the eye or bud; gum is also subject to form itself, and the process is

vegetable and animal kingdom, as it is by judicious unions in each, that the one and the other are procured in the highest perfection. The most flourishing breeds will degenerate, unless care is occasionally taken to cross them again.

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surer of success, by putting it off till the lateness of the season has diminished the vigour of the tree. With a view to prevent the inconveniences resulting from the ordinary practice, as soon as the bud is well taken, the stock must be cut two or three inches above it; as, by this means, it will be preserved, and excited to develop itself.

When the peach tree is budded on the almond, it acquires strength sooner than when it is budded on the plum tree, while the borders reap an evident advantage from it by not having their manure exhausted to no purpose, in supporting the suckers of the latter. I pulled out last year suckers from the same plum tree at five different times, all of them almost as strong as those which are commonly used in transplanting. Whenever this stock is to be used, it should have been raised from a kernel, as it becomes finer, and throws out fewer shoots, than that which is raised from a sucker.

The principles which I have just explained, in the cultivation of the peach, are applicable to that of the nectarine and apricot. Be it as it may, the practice of raising different trees after each other, is, independently of any hypothesis, adapted to all circumstances,

CHAPTER IX.

Of the Means of rendering Trees fruitful—An Abstract of M. Lancer's Experiments on the Subject—How to Cure the Canker—What is its Principle—Inference drawn from the Practice recommended.

THE crops are the chief object in raising fruit trees; there are several expedients in use to make them bear; there are some trees which, from a natural defect, are condemned to a perpetual barrenness, and are incapable of yielding any produce. The unfruitfulness of others, arising from causes essentially different in themselves, makes it impossible to prescribe a mode of treatment adapted to all cases. Sometimes they have been made to bear by making a hole to the heart with a borer, and then stopping it up with a peg, by splitting the trunk longitudinally, by suppressing some of the roots, &c. These are violent, and often destructive methods, and which it would be difficult to refer to any solid and established principle. In other respects, as nature troubles itself but little in the vegetable, and still less so in the animal kingdom, with the secondary object of propagating the species, at the time it forms the individual; it will seldom allow these means to be had recourse to, before the trees are come to their full growth. They must, at least, be suffered to attain a certain degree of strength, before they can be expected to produce plentiful crops. Such as bear young, remain slender, exhaust themselves, and disable themselves from bearing afterwards.

From the circumstance of there not being found, in this island, any calcareous substance, except that of a few shell fish (which is but trifling), it is a long time since, that some agriculturists would have concluded, *a priori*, that lime would be our best manure.*

The fact is no longer problematical. It may be laid down

* Rliogue, otherwise called the rustic Socrates, lays it down as a principle, that the best manures are such as differ most from the nature of the soil. I believe that this idea is just. In support of this theory, I will state a fact, of which our cultivators may avail themselves.

from numerous instances, without any fear of being mistaken, that quick lime buried in small quantities about the end of autumn, a few feet from the trunk of trees nearly come to their full strength, is an improvement which will seldom fail to increase their produce, or to determine it, when it is not yet decided. Unless the cause of unfruitfulness be very obvious, a wise cultivator will first make a trial of this method, which, at any rate, is innocent, before he has recourse to measures, which, instead of being serviceable to his trees, might end in their destruction. Some use may also be made of wood and sea-weed ashes, of sea-weed itself, of dung; road dirt, &c. taking, however, the above precaution of burying these substances at the proper season, at a certain distance from the trunk. There is, besides, another practice, which is, to lay bare the large roots in the winter, and let them be exposed to the frost. Some persons who have tried it speak of it in high terms.

We are indebted to the investigation of the famous Buffon for another process, which, having been since evinced by the successful experiments of M. Lancy,* and uniting in itself many signal advantages, has, of late years, acquired extensive celebrity on the continent. It must, however, be used with caution, as otherwise it might endanger the life of the tree. To convey a right understanding of his method, and to guard against the abuse which might be made of it, I shall subjoin a summary detail of the principles on which it is founded.

It has long been received as a fact, that the sap circulates alternately in two opposite directions, ascending mostly through the bark in the spring, and descending in the same manner towards the earth after midsummer. A reason that seems to decide in favour of its flowing up and down, is, that trees divested all around of their bark in a horizontal direction, were it only a foot long, can seldom survive the operation more than two years; the distance being sufficient to preclude the lip, or extremity of the upper bark, from the possibility of effecting a re-union with the lower bark. Buffon, having observed that trees upon the decline more frequently bore fruit than others of the same species, concluded, that, by shortening the distance between the bark, so as to bring upon them only a slight degree of transient decay, it would probably contribute to their becoming fruitful. He

Last autumn, two adjoining fields in St. Saviour's parish, as equal as possible in size, depth of soil, and exposure, were manured after a crop of parsnips. There were spread on the former field ten cart-loads of dung, and two cart-loads of sea-weed ashes; and on the latter, ten cart-loads of dung, and one cart-load of lime; they were then ploughed up and sown in the like manner, with the same kind and the same quantity of wheat. I afterwards examined both at the time of harvest, and I ascertained, that the latter field had the advantage over the other, in the proportion of above one-third in the quantity and quality of the grain, as well as in the strength of the seed. I cannot attribute this difference to any thing else than the lime.

* *Encyclopedie Methodique, Art. Bourrèc.*

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accordingly found, that, by reducing it to a small annular decortication, they bore plentifully. M. Lancry having confirmed the positions of Buffon, and added to it many experiments of his own, ascertained that fruit obtained in this manner, is considerably larger and ripens sooner by nearly three weeks, than that from the spontaneous production.

It is evident, that nature forsakes, in a great measure, the part above which the operation has been performed, from the tree in almost every instance striking shoots below the wound. The practice we are now treating of, must therefore be limited to such trees, as are of a competent age, and only to a certain number of their branches. It is also so far from superseding the beneficial application of manure, that it more particularly requires it as the tree remains exhausted by a preternatural exertion.

The result of M. Lancry's practice, is:

1st. That the operation is applicable to every species of fruit trees, but is more advantageous to vines, as the wood shoots freely, and requires to be often renewed.

2ndly. That the best season to perform it in, is early in the spring, but may, however, be done occasionally in a more advanced state of vegetation.

3rdly. That in order to have the wound closed up in the course of the year, a circumstance very essential to the restoration of the tree from its temporary languor, the annular decortication should not in general exceed in length one-third of an inch.

4thly. That the bark should be perfectly scraped off from the woody substance.

5thly. That if the tree should not produce fruit the same year the operation has been performed; it certainly will on the subsequent.

The apple and pear trees of the tender varieties, which are subject to canker, or lose by mortification during the winter the shoots of the preceding summer, bear fruit but seldom; and even then, it is of a bad quality. It will be of little avail to prune off the branches as they get cankered, because the succeeding ones perish like those which had preceded them. I will now describe a mode of treatment against this disorder, which has never yet failed me. As it restores the health of the tree, it excites it to shoot out new wood, and in a few years makes it bear plentifully. The following instances will enable the reader to judge of its efficacy.

About twelve years ago, I had a standard pear tree, of the sort, called here little St. Michael, which had been planted from sixteen to eighteen years in a good soil. It had been grafted on a free stock, but its boughs were so cankered, that it seldom bore, in the best years, more than five or six wretched pears, tough, and full of crevices. After having, at several intervals, attempted to cure it to no purpose, by retrenching the decayed parts, I ventured at length to cut off its top, having often observed, that forest trees which had

been

been lopped in the common way almost never cankered ; indeed, event was answerable to my expectations. From that peving it has not only thrown out vigorous shoots, without having any branch cankered, but it has produced the best, and finest fruit of the kind, that I have ever eaten, and in such a plenty, that last autumn it did not produce less than two bushels. Having experienced a succession of similar fortunate attempts, I have acquired so much confidence in this remedy, that I apply it now to all the trees which show the least symptom of that disorder, without making any distinction between apple and pear trees ; I take care, however, that they should have been planted where they are to remain, for three or four years before, that the root may have had time to strengthen itself, and be enabled to afford the trunk a plentiful nourishment, and make it put forth healthy shoots ; grafts have even been made use of, taken from the tree I have just mentioned, without the ones which were propagated from it, having ever after shown any sign of canker.

Having extended this principle to two vines, which bore almost nothing, they had the next year five bunches of grapes on some of the twigs, four on some of the others, and three on the least. I have lopped, under the same circumstances, pear trees grafted on the quince, which had been planted more than twelve years, but which, three years after the operation, were become stronger than they were before, and which have at present all the appearances of perfect health. An old, barren pear tree, grafted on a free stock, in some measure made young again by this practice, is become fruitful. I have equally succeeded on a golden pippin. As the improvement of the tree, and almost a moral certainty of its future fruitfulness, afford an ample recompence for the delay in its produce, it will be prudent to have rather recourse to this method, than to plant another, the success of which must then be always doubtful.

A proof that this process, when judiciously executed, is far from being hurtful, is, that the tree shoots, and generally keeps its leaves later in the season than others of the same kind.

It may be asked, what is the principle of canker ? The solution of this question would be as curious to the naturalist, as it would be important to the cultivator ; but this, I believe, has not yet been satisfactorily done.

It is probable that this disorder is occasioned by many causes independent of each other, such as a cold and exhausted soil, a poor gravel, a too close clay, the extreme dampness of the ground, the want of shelter, and the like ; but what seems to me to be the chief cause of it, and the most common, is the oldness of the varieties ; this being equally the case with fruit trees that have gum, and with such as have not. It is very seldom that this disorder attacks forest trees, and when it does, it is easy to trace the occasion of it to some of the sources I have just mentioned ; moreover, they are not raised, or at least

least they ought not to be raised, with the exception of a very small number, by grafting. As nature renew's them at each generation by means of seeds; there exists a remarkable uniformity in the shape, the taste, and the size, of their fruit; making allowances, however, for the difference resulting from the mixture of the impregnating substances they derive from each other, the variety of situations, of climate, and of soil.

Although fruit trees are, in many respects, subject to the same laws as forest trees, yet, when the varieties of the former are distinguished by any very excellent produce, they are proportionably sought after, and, with the view of re-producing them, recourse is then had to grafting. This is the reason, that among apples, the nonpareille, the golden pippin, and the pearmain, are so often to be met with; and among pears, the culmar, the bearré, and the charentel. Nature is so copious in all its productions, that probably there were never found any two of these varieties, or of any others, which were precisely the same, and that the difference observable among those of the same kind, is owing to the soil, the situation, and the trees themselves, which, in a few years, change in a great measure the peculiar characteristic of the fruit; * they all in time become exhausted, they decay, and are attacked by the canker. Now the following account is that in which, I think, that this disorder occasions the loss of fruit trees.

As it is the property of heat to dilate bodies, and that of cold to contract them, it follows, that during the summer, the channels of vegetable productions being expanded, the nourishing juices will freely circulate into them, and excite them to throw out shoots. On the contrary, in the winter, these channels, which were already too contracted, being drawn closer, they are disabled from performing their functions, the course of the sap is checked, and its passage being obstructed to the parts farthest from the trunk, where nature is least active, it is obliged to flow back into the parts which are nearest to it. This is the reason, that, in the first stage of this disorder, the extremities of the branches being deprived of nourishment, get slender, dry up, and die. If trees, when in this state, are transplanted into a better soil, and especially if the temperature is a few degrees warmer, they recover; but the remedy which I have just recommended, concentrates for a certain time, in the roots and trunk the nourishment which was intended to have made the top grow, which has been lopped off. The beneficial effect of this operation on the tree, is, that it acquires by it new vigour, that it supplies its former boughs with others stronger and better grown; and, lastly, that the sap being of a better quality, is more likely to convert itself into fruit.

* There are commonly reckoned three varieties of the bearré; the grey, the red, and the green: Miller assures us, that he has often met with all three on the same bough. I am convinced, that an attentive observer might say as much of many other sorts, apples as well as pears.

When

When, after this treatment, the tree puts forth in the spring only one strong and luxuriant shoot, one may then reckon that it will be crowned with complete success. When there appear many shoots, it will be proper to allow all those which are above the graft to strengthen themselves during the first, and sometimes even during the second, year. As the leaves contribute considerably to the support of trees, and with respect to them, perform the same functions as the lungs do in animals, it will not be right to begin pruning them before the following spring. By doing it too soon, there would be a risk of causing a revolution, which would be dangerous to the vegetable economy.

As nature has assigned bounds, as we have just seen, and those too narrow enough to the duration of varieties, there exists a point, no doubt, beyond which it would be in vain to flatter oneself to prolong their vigour. But, among such as are not yet perfectly worn out, it is possible, after the above practice, to restore many individual-trees, which would otherwise have been consumed with canker, and have remained barren.

It may be added as a corollary, that it is a better practice to graft three or four years after the trees have been planted in the orchard, than to do it in the nursery. They suffer less from it, are not so subject to canker, and bear more and better fruit.

CHAPTER X.

How to protect the Blossom of Fruit Trees against the Frost—Different Ways of securing them against Caterpillars.

UNFORTUNATE circumstances will sometimes happen, when all the precautions we can take, will not prevent the loss of our crops. There are, however certain expedients, by means of which it is possible to correct some of the inclemencies of the weather.

The Chevalier De Bininberg, Counsellor of State of Bohemia, having surrounded the trunks of several trees with straw ropes, one of the ends of which rested in vessels full of water, observed that the ropes, by acting as conductors of the cold, had preserved the blossom, one night that all the other trees in the neighbourhood had lost theirs through the intense cold of the frost ; having afterwards repeated this experiment several times, he assures us, that it never failed to succeed. It is also a good practice for the protection of wall trees, to cover them, during the winter, with a small masked net.

The depredations of insects, will often do trees very serious injuries. It is possible to prevent the mischief they would cause, by exposing them to the smoke of a smothered fire lighted to windward of the orchard. Some cultivators of reputation maintain, that, by making use of this preservative, plentiful crops may be obtained, in years when the neighbourhood experiences a total failure.

The caterpillar devours plants ; the apple and pear trees, the gooseberry bush, the thorn, and indeed, almost all sorts of trees are a prey to its ravages. “ It multiplies to such a degree, (says M. De La Laure), that one may see two generations of it yearly, unless care is taken to destroy it. Every female lays from three to four hundred eggs, whence are hatched as many caterpillars, which multiply in the same progression,

progression, so that a single one may in one year be the mother of more than a million of individuals of her own species. This prodigious fruitfulness shows the necessity of attending to the destruction of these insects, which are capable of ravaging all our fruit trees."

It is a fortunate circumstance for the cider grower, that the caterpillar serves for food to many sorts of birds. The ashes and smoke of sea-weed, tar water, the decoction, the powder, and smoke of tobacco, flower of sulphur, quick lime, and plaster of Paris, pulverised, and the like, destroy it. I have been assured, that the elder with its leaves on, keeps it at a distance.

There is here an additional reason for using the composition recommended in the Fourth Chapter, to be applied to young trees lately transplanted, on which this insect throws itself preferably to all others.

All that I can say as to the efficacy of this composition, is, that caterpillars have never attacked those apple and pear trees of mine, to which it had been applied.

CHAPTER XI,

Of Cider Apples—Of the Varieties of the Island—Which are the best to be raised—What must be done to improve their Quality.

IT is almost impossible to decide precisely, which is the apple that affords the best cider. The qualities of this fruit, as well as that of all other fruits, depend, in a great measure, on the climate, the soil, the exposure, and the age, of the tree. Some persons have extolled l'amer ou gentilhomme, and the redstreak has enjoyed a high reputation; but the one and the other are now worn out. Every thing that is the work of man impairs itself, and passes away like him. There are many at present, who give the preference to the Freuen, the Römeril, the Lucas, and the Lamey,* varieties, which, in their turn, will become the victims of time. Some growers choose a mixture, supposing that one single kind of apples never contains all the requisites which are proper for making cider: What are we then to follow? Every one determines himself according to his own notions, or his experience. It is, however, observable, that generally, cider made from sweet apples, is not brisk; that sour apples give a harsh taste, (though were I to judge according to some experiments I have made, with a view of ascertaining the fact, I should be inclined to think, that the latter gives cider a degree of perfection above all other fruits,) that the bitter and the bitter-sweet yield, for the most part, a good liquor; that the best tasted apples do not commonly afford the best; and that late fruits, with a few exceptions, contain the most vinous juice.

The principal recent varieties, are the only ones that deserve to be raised; it is losing both time and trouble to cultivate the old ones: we should be directed, in our choice, by

* These are all varieties of sweet and bitter apples peculiar to the island.

local circumstances. A variety, which may be advantageous in a particular soil and exposure, is, perhaps, worth but little in any other; let it be, if it is possible, drawn from the farm ; when it can be done conveniently, it would be desirable to plant the seedling in the orchard, and let it produce its own fruit; if it was good, it would become a valuable acquisition; if not, the change which the tree would then undergo to bear better, would only occasion a delay of short duration.

It is to be wished, that there should be published a comparative view of the apple trees of this island, in which were set down the age of each variety, its appearance, its size, its blossom, and its fruitfulness; its relative nomenclature in different districts, the taste of its fruit, its characteristics, the time of its being ripe, and the quality of its juice. It would be very difficult to perform this task well, but it is of the highest importance. Till something of the kind has been done, the great bulk of growers will be deprived of many rare varieties, which are naturally to be met with among so great a number.

CHAPTER XII.

Of Sorting the Apples—Of the Grinding of Trough-falls—Of Shovels.

If the pleasant taste of cider depends on the nature of the fruit, yet it acquires its highest degree of excellence, when it is made after a process combining just and appropriate rules of art.

In the first place, the sorting of the apples is of too much importance to be entrusted to children. The grower would be amply indemnified of the expense, if he allowed moderate wages to persons capable of paying it a proper attention; the fruit which is in any way rotten, must be set aside; as to make a very good liquor, the apples should be in the best condition; they should be ground when they are fully ripe, taking care, however, not to mix the unripe with the ripe ones. The success of the work depends, in a great measure, on the fermentation, and that which would result from this mixture would be imperfect. As the saccharine part of fruit is the last to detach itself, it is better to let it get over ripe than to use it before it is come to maturity. In the former case, the cider pressed from over ripe fruit, is commonly destitute of tartness, but is free from any bad taste; while, in the latter case, it becomes so harsh and sour, that it is scarcely drinkable.

It would be to no purpose to mix the rotten with the unripe fruit, in the hope that they would mutually correct each other, as both sorts are defective from the same cause; the liquor of the rotten, as well as that of the unripe, is not susceptible of sufficient fermentation; to obtain a sufficient one, the fruit must be in a state to produce mucilage. As the mixture of the rotten and unripe contains but little alcohol or spirit, it is not even by itself proper to make good vinegar.

Whoever wishes to proceed according to rules of art strictly just, will not defer the grinding till the fruit exhales a strong rank smell; but he must seize the moment when it gives

gives the first symptoms of it ; this smell, which is the consequence of the complete loss of its aromatic principle, proves that the critical time is already past.

If the stone trough should be filled too much, some of the mash will run out in grinding, and if it is not sufficiently full, the work will go on too slowly. With a view, therefore, of keeping a proper medium, and saving time, it is desirable to fix in the floor, above the grinder, a mill hopper of an adequate size, communicating with it by means of a pipe, through which the fruit may be distributed as it is wanted to be ground.

The apple juice, which is of a pale white at the time that it is pressed, shows that when it is exposed to the action of the air, some property of that fluid deepens its colour ; the following experiments afford a proof of it :—

First experiment.—Having cut an apple in two, I immediately covered the surface of one of the halves with a piece of glass, and left the other exposed to the air ; the latter almost immediately became of a yellow brown ; but the former was not altered twenty-four hours after, when I removed the glass.

Second experiment.—I cut another apple, placing one of the parts under the receiver of an air-pump, and then pumping out the air as much as the machine would allow. The surface which had been cut, was very little altered two days after when I took it out.

It is proper then to make small trough-fulls, not only with respect to cleanliness, but because the mash, by being exposed to the influence of the atmosphere, more easily absorbs its oxygen, which is the generating principle of acid, which heightens the colour of ground fruit, and improves its saccharine quality. This practice becomes indispensable, when the fruit has been ground before it is quite ripe. The mash is sufficiently ground, when it falls gently after the wheel, and detaches itself from the sides of the trough.

It requires to be allowed time to incorporate itself together ; the greener the fruit was, the longer it should be left to stand ; that of fruit fully ripe requires a space of from ten to twelve hours, and the other in proportion.

Wooden shovels are the only ones fit for use, iron ones being liable to turn the cider black. The malic acid, being always combined with an astringent principle, when it comes in contact with this metal, produces a kind of ink.

* It is now known, that atmospherical air, which was formerly considered a simple substance as an element, is itself compounded in this climate of nearly 0.27 of oxygen gas, of 0.72 of azotic gas, and of 0.1 of carbonic gas.

CHAPTER XIII.

Of an Improvement of the Stone Trough—Comparison of the Stone Trough, and the Mill with Cylinders—How to make small Cider.

THE rind of apples, as it has been said before, is aromatic, and the seeds are of a pleasant flavour; but it is impossible to grind either in common stone troughs which are made rough, so as to prevent the wheel from sliding over the fruit; a cheap contrivance therefore has been discovered within these few years to remedy this inconvenience: it is, by fixing in the inside of the trough a circle of fellows (see Plate I.) from three to four feet in diameter, over which a trundle head works, communicating by the axle-tree with the mill stone.

This construction contains great advantages:—

1st. By allowing a sufficient polish to be given to the trough and the mill stone, so as to make it impossible for it to slide, it necessarily exposes the rind and the kernel to their action.

2dly. It makes the operation of grinding the fruit more expeditions, at least by two-thirds, without increasing the labour of the horse.*

3rdly. By means of re-grinding the cheese, from which the best cider has been pressed out, it enables the proprietor to extract from it a good family drink; so that the quantity which has produced three hogsheads, being steeped for twelve hours in a sufficient measure of water, may still yield one of small cider† washings.

* The author has often had ground at his trough, which was put up on this plan, from seven to eight bushels of apples in less than a quarter of an hour. The expedition resulting from that admirable machine, is, however, to be considered, only as a secondary object, as the liquor is better, the more time is allowed to grinding the fruit. It is only in a strong year, and when the lateness of the season obliges one to have recourse to all sorts of means to accelerate the work; that its expedition becomes an object of particular importance.

† Phillips, in his poem on Cider, has a very appropriate passage on this subject:—

Thou, more wise, shall steep
Thy husks in water, and again employ

Mang

Many English growers, with the view of making the most they can of the kernels and the rind, and to make the mash absorb more oxygen, grind the fruit a second time, ten or twelve hours after the first trituration. This practice, in my opinion, is very useful.

Some persons among us now forsake the use of the stone trough for that of the mill with cylinders; Is this change useful? The reader will be able to form an idea of the subject, if he will but throw a glance on their respective qualities.

Let us then begin with those of the mill with cylinders.

The place for it, does not differ essentially from that which is necessary for putting up a trough; however, the mill is more compact, and the room may serve for a stable, when the cider season is over; the first expense is nearly the same in either case. As to quickness in the process, the mill is to the common trough in the proportion of two to one at least, but a resisting body which might be among the apples, could put it out of order, when it is made with knives, or make it unserviceable, when it is with fluted cylinders; it is possible that this accident may happen in the very midst of the season. The acid of the fruit corrodes the iron, the oxidation of which is, in the highest degree, injurious to cider; in short, after its ordinary construction, (susceptible of improvement no doubt), it hardly does any thing besides chopping the apples; their juice remains poor, and fermentation does not reduce the fruit, unless it be allowed to stand for several days. This latter process is not only contrary to all good rules, but in a plentiful year, would be impracticable.

As to the trough, the repairs it requires are in no proportion with those of the mill; when it has once been put in order, it may keep so for generations with the addition of a little cement, and be serviceable for ages. Besides, the trough may be applied to a number of purposes, and cultivators of every description may in one way or another, derive the most essential advantages from it.* The delay occasioned in

Thy pond'rous engine. Water will imbibe
The small remains of spirit, and acquire
A vinous flavour; this the peasants blithe
Will quaff, and whistle, as thy tinkling team
They drive, and sing of Fusca's radiant eyes,
Pleas'd with the medley draught.—BOOK 12. v. 103.

* The trough, even in the way it is in general fitted up, is admirably well adapted for preparing clay for masonry, pottery, bricks, mud walls, and the like, the process being much quicker, and the work better, than when it is done with the spade. Mortar made in this manner, though it be wetted with only one third of the water commonly used in making it, fashions itself sooner, is more binding, not so liable to crack, and is cheaper. Since the author wrote this note, government has adopted his suggestion of preparing mortar in a trough, for the fortifications now building on the Town Hill, near St. Hilier's, Jersey.

Might it not be possible, by using a machine, constructed on nearly the same principles, to quicken considerably the work of kneading in bakeries, where large quantities of bread must be baked daily?

grinding

grinding the fruit, is a defect which is now partly corrected by the mechanism I have mentioned, and which is applicable to all troughs. It seems, that the slowness of the work is more than made up for by the complete manner in which it is done;

In short, they who wish to spare room, who had rather gain on the time of making, than on the quality of the work; who wish to have for preparing the mash an expeditious, though precarious machine; rather than one of resistance, applicable to several purposes, but which works more slowly; such persons, I have no doubt, will determine their choice in favour of the mill,

If the trough has been some days without being used, it should be washed, as without it, it would give an acid taste to the next mash. The surest way is to rinse it after each mash with a few buckets of water.

It is indispensable to employ in the construction of it, a stone not calcareous, on which the acid has no effect. This is one of the characteristics of granite; such is the stone of the neighbouring small French island of Chausey, and among us, that of Mount Modo. These two kinds are perfectly adapted to it in this respect, as well as in that of their grain, which is susceptible of a sufficient polish.

CHAPTER XIV.

Of the Single Screw, and the Double Screw—A new Construction of this latter Press—A Mode of repairing the Head of Broken Screws—Hydrostatic Press.

IT would be foreign to the purpose to give a detail of all the utensils which are made use of in making cider; but as the single screw, and the double screw, the only presses in use among us, are pieces of the utmost importance, it will be proper to give here a sketch of their respective advantages.

The English make a great use of the single screw. That press, which always acts in a direction perpendicular to its base, acquires an immense force by means of a nut of brass, and an iron screw. After the first expense, the proprietor will be for a long time without being obliged to have recourse to any repairs, which is a consideration of great weight; it is, however, a sort of improvement very rare among us, on account of the expense into which it draws the grower.

Being totally made of wood, the double screw deserves the preference; because, in this respect, theory and practice agree perfectly well together. In fact, without being originally dearer than the other, it lasts as long, and augments its force, when it becomes most necessary to it, that is, in proportion to its sinking; while the single screw loses his in the same ratio: one man can manage the double screw without adding blocks. The single screw wants some to be added, according to the degree the cheese sinks in, and requires to be raised up, when they are to be added; but this is a tiresome work, and which wastes time. In the former case, one screw draws assistance from the other screw; in the latter, it acts by itself. The former of these presses becomes stronger by the elasticity of the beams; the latter works by a *viv inertia*, which diminishes every moment.

The double screw is made still more advantageous, by joining nuts of wood strongly secured with bands of iron, and fixed with the hinges of the same metal to the second beam,

at

at each end of which there is an elliptical hole, which allows the screws to work easily (see Plate II.); while the screws bearing at top against the third beam, (which consists in a thin beam annexed to two upright ones) are kept steady by means of pivots.* The nuts being moveable and rounded under, by allowing the second beam to descend alternately nearly two feet more one way than the other, the work is in a great measure secured against the awkwardness and want of skill of the labourer.

In the ordinary construction of this machine, there is simply but one power in action; instead of which, we have here three combined together. The first results from the base or lower beam, which raised from the ground and supported by blocks of stone, and yielding to the pressure of the screws, re-acts upon the cheese. The second springs from the middle beam, which, being sawed in four planks, except sixteen inches in the middle, and thereby become very elastic, concentrates its force on the same point as the former. The third is derived from the upper beam, which, by adding essentially to the force displayed by the other two, consolidates the work, causes an opposition to the screws, and, by its re-action, prevents their† heads from breaking. Such is the mechanism of a press, thirteen feet and a half long, which I have had put up, by means of which, six hogsheads of cider have often been pressed out in one day. A boy, with the help of a capstan, is able to work it.

Formerly, when a screw broke, the accident never failed to occasion the loss of much valuable time; but the means have been found to remedy it in a few hours. We are indebted for it to Sir John Dumaresq, chief magistrate of this island.

At the most busy time of the season before last, the head of one of the screws broke, and rendered his press unserviceable; he called in workmen to no purpose, as they all declared that there was nothing to be done besides substituting another screw; he then contrived an expedient, of which the following is an abstract:—

He caused two spars to be brought, (see Plate III.) AA. from seven to eight inches square, and two feet longer than the screw; he had them joined together in a parallel direction, about eight inches from each end, by two cross boards, BB. of four inches by six, sufficiently long to enable the spars, by embracing the lower beam at C, to allow the upper beam at D. to work up and down.

* Timber may be used for screws the very year it has been felled; after boring a hole at the centre, from one to two inches in diameter, from one end to the other, it must be steeped quite green in water for some months, and then dried in the shade; this method prevents it from warping; the screws are secured against vermin, and rendered perfectly smooth, by daubing them over with a mixture of soft soap and black lead in powder, in the proportion of two parts of lead and one of soap.

† Deal, being more elastic than other timber, is the most proper for the beams.

He had then this parallelogram raised vertically; he made the truncated end of the screw at E. to rest upon the lower cross board, and passed through the middle of the upper board a round iron gridiron at F. from three to four inches in diameter, and eight in length, which was driven into the end of the screw, to serve it as a centre of motion, and to keep it in its place. The wheel and spokes having been removed, there remained four mortoises; as the spars obstructed the working of the screw, he had four more mortoises added, G. in the space between the former ones, that it might the more commodiously be worked with a lever.

By means of this supplemental part, at once ingenious and simple, he was able, without losing any time, to make that screw as useful as a new one; it then bore against the top; instead of that before, it bore against the bottom. The double screw, repaired in this manner, succeeded perfectly well during the season, and might have lasted for many years longer, if it had not been taken down to make room for a single screw of iron in its place.

With a view to facilitate the carriage of a large quantity of hay within a small compass, a press has been invented in England, which is now actually used to condense the trusses, and which makes them as hard as boards. This surprising effect is the result of an hydrostatic press, for which Mr. Bramah, the inventor, obtained a patent in 1796. I mention that machine, as it might be made serviceable in cider-making; it is possible, that after the patent is expired, it will be used for that purpose; at present, it is very dear,

CHAPTER XV.

Of Reed Straw and Hair Cloths to lay the Cheese—Of the Use of Wooden Sheets.

ONE may lay the cheese, with reed straw after our custom, or make use of hair cloths, after that of Herefordshire. Reeds which have been well preserved, communicate no bad taste whatever to the cider, a fact which is proved by experience; but there is no person who can be ignorant, that a single handful of bad reeds is enough to spoil a whole cheese; on the contrary, there are very few of our growers who are acquainted how much cleanliness hair cloths require. Unless they are washed as soon as the work is done, (except, in case they are to be used again immediately) they heat, get sour, and operate like leaven on the next cheese. In manual processes, which are not attended with serious inconveniences, one is often obliged to abide by the practice of the country; because, if he attempts to depart from it, when his situation in life is such as to require the work of others, he must expect to be under the necessity of never losing sight of his labourers.

Let us now make an analysis of each practice. As the grower is, in general, provided with the reed necessary to lay his cheeses, he has nothing to disburse; he takes, indeed, on the income of his farm; but, as the supply of this article goes even with his want of it, and is at hand, he finds the expenses less burthensome, than if he was obliged to procure it all at once.

But it is a matter of importance, to which few persons attend, that unless the cheese knife is kept clear and well wiped, it is very subject to turn the cider black. From the want of tracing this effect back to its origin, it is often attributed to causes which have no reference to it. The extreme divisibility of bodies, proves that a very small portion of iron, decomposed by the acid of the fruit, is sufficient to colour a considerable quantity of liquor.*

As

* Odoriferous substances, as we have already seen, establish this principle. Fire is another striking instance of it. In a dark night, a lighted candle

As to the cloths, linen ones get too thick, and last but little; the hair ones cost from seven to eight shillings each. There must be from twenty-four to thirty cloths, each of them four feet square, to lay one cheese perfectly well; the thinner the layers are, the better and more expeditiously it is pressed out. With a view to do the work easily, it is right to provide another set for change, so that the whole together may amount to about 20l. On the other hand, these cloths may last from twenty to thirty years, they drain the cheese completely, and are not, in the least, injurious to the cider; they also keep the room in the most exact state of cleanliness, and as the work is commonly done by candle light, they prevent the danger of fire, which the reed might occasion; add to this, that the second pressing for small cider is more easy when the cheese is not encumbered with reeds. After having for a long time practised both methods, I have, at length, given a decided preference to the latter; I am persuaded that, independently of its other advantages, and that even supposing, as I do, the cloths to be double the number of what is strictly necessary, it is in the end the more economical.

As this practice is very little known in the island, the following description of it may be useful to such as may wish to avail themselves of it.

By means of a board of three-fourths of an inch thick, and four or five inches wide, there must be formed between four slight pillars, (which are removed as soon as the work is done) a square frame of three feet, laid on the middle of the press board; having spread on this frame a hair cloth, the edges of which fall down equally on all sides, and thrown into it a few shovel-fulls of cheese, it must be laid even with the hand or with a wooden trowel; the edges of the cloth are then turned up and laid even with the cheese, and the same process is repeated for a second and third layer; after that the frame is raised up, and in this manner the work is continued perpendicularly to almost three feet high; when it is finished, the board must be placed horizontally upon it, and then it is screwed down.

The cheese must then be pressed gently, till it has yielded a part of the cider it contained, and acquired some consistency; it is seldom necessary to screw it down more than once at my press, and never more than twice. Such a cheese may be laid in less than an hour, is pressed dry in three or four, and yields about two hogsheads of cider.

A pair of wooden shoes must be solely appropriated to the use of the press; this sort of shoeing is the most suitable to it; the effluvia of dung and other filth impair the cider, especially when it is new. The excrement of the horse grinding the fruit, ought not to be neglected to be quickly carried away.

candle may be seen at three miles distance. This gives the diameter of a circle of six miles, and a circumference of above eighteen miles. The candle lightens horizontally all the parts of this space, more or less, which would fill a sphere of more than 113 square miles.

CHAPTER XVI.

Of Pressing—Of Re-grinding—Of the Moon's Influence—Of the Apple Cheese—Of Hoops.

WHICHEVER of the two methods is adopted in laying the cheese, it is indispensable, that it should be pressed out without delay; the more the fermentation which follows is uniform and simultaneous, the more the liquor will preserve its flavour. To this reason there is added another, that evaporation, by wasting no purpose the fluid part, would occasion a considerable diminution on a quantity of cider.

The first draft is preferable, however, when it is not intended to make small cider; it is no less acting according to good rules than economy, to drain the cheese as much as possible, as thereby the fragrance of the rind and the flavour of the kernel are extracted; it is necessary, to filter the liquor, to put under the cheese board a hair cloth, or a basket-full of straw.

There are persons who think, that the influence of the moon affects the making of cider, and they assert, in support of their opinion, that such as is pressed out, when it is decreasing, by being less disposed to ferment than the other, retains a more pleasant taste; I am not able to decide positively on this point; still, I think that it deserves the less to be attended to, as the success of the management I shall detail in the course of this work, is ascertained by experience; besides, it is evident, that if that direction was followed, it would occasion a waste of half the time. In short, if there exists any foundation for this notion, it is, perhaps, rather on account of the delay, than any lessening in the fermentation.

When the cheese has been pressed in such a manner as not to yield any more cider, if it is but taken down, and broken into small pieces, then laid on a second time, and treated as before, it will still afford some gallons of it; but this latter liquor is perfectly clear.

It is said, that the apple cheese is pernicious to the ground : it is a well attested fact, that it has not been fully shown what are its noxious properties ; might not the evil rather derive its origin from the too great abundance, than the quality, of this substance ? This is a question which would well deserve to be explained. It is probable, that under certain modifications, the apple cheese might be useful to the ground ; when it is exposed for any time to the action of the atmosphere, it becomes saturated with oxygen. For this reason, there is room to believe, that if it was mixed with quick lime, it would be capable, by neutralising itself, of being made a valuable compost ; be it as it will, it may be turned to good advantage as fuel. Its elements having been changed by combustion, the ashes afford good manure. In Normandy and Britany, where they keep it in pits, and occasionally mix some of it with bran and lukewarm water, it is a great resource for feeding pigs during the winter. Every body knows how it is applied here in feeding cows.

It may be asked, which is the more economical plan, to use iron or wooden hoops ? The former last longer, and thereby a great deal of valuable time is saved ; the expense of repairing the casks is, in a great measure avoided, and they are also more easily prepared to receive the liquor. All these circumstances together, seem to make up for more than the difference in the original price, and to concur to give them the preference with those individuals who can go to the first expense without incommoding themselves. This is the only sort of hoops in use among the London brewers ; I am, however, led to believe, that it would be desirable to mix the two sorts together, as is done by many nations with respect to their wines. To keep iron hoops well, it is necessary that they should be painted.

CHAPTER XVII.

Of Pipes and a Forcing Pump—Objection to the Use of Lead in making Cider—View of the Criminal Use made of that Metal in Wine and Spirituous Liquors—How to Analyse them.

WOODEN or leathern pipes, and a forcing pump, are more expeditious, and in the long run, less expensive than pitchers; an hour's work is sufficient with a pump of a foot long and three inches and a half in diameter, to fill a tun of four hogsheads, without losing a drop of the liquor; it may be turned in box, guiacum, or any other hard wood whatever.

The author avails himself of this edition to correct an oversight, which had escaped him in the former, in which he recommended a leaden pump.

The acid of the cider causes the decomposition of that metal, and the friction of the piston accelerates its effect. It might be supposed, that the detached particles would precipitate with the lees, and have little or no influence on the liquor, after it had once worked; on the contrary, the lead remains suspended in the form of a compound salt, and becomes a very rank poison; * and, therefore, it is of the very highest importance to proscribe the use of it, as well as that of copper.

The following extract is drawn from an eminent author, and indicates how to discover a fraud, which is often practised by means of lead, to disguise the bad quality of wines; at the same time, it points out clearly the danger of using any in the manufacture of cider.

“ Many commodities, (says Rousseau, †) are adulterated to make them appear better than they are. These deceptions impose upon the eye and the taste, but they are pernicious, and make the thing adulterated, notwithstanding its fine appearance, worse than it was before.

* It is probable, as it has been thought, that the custom of covering the cheese board with a sheet of lead, through a foolish idea of cleanliness, has given birth in some of the cider districts in England, to the disorder known under the name of the Devonshire Cholic. The Jersey people, who have never followed that practice, are totally exempt from it.

† *Traité de l'Éducation*, liv. 3, p. 43.

"Drinks, and especially wines, are adulterated, because it is more difficult to know the deception, and that it gives more profit to the deceiver.

"The adulteration of new or sour wines is done with litharge, which is a preparation of lead. Lead, when united to acids, makes a very sweet salt, which takes from wine the taste of being new, but which is a poison for such as drink it. It is then important, before drinking suspicious wine, to know whether it has been impregnated with litharge or not. Now, I reason in this way, to discover it.

"Wine does not only contain an inflammable liquor, as may be seen from the brandy extracted from it, but it also contains acid, as may be known from the vinegar which is drawn from it.*

"Acid has an affinity with metallic substances, and unites itself with them by means of dissolution; to form a compound salt, such for instance as rust, which is nothing but iron dissolved by the acid contained in the air or water, and such is also verdigrease, which is only copper dissolved by vinegar.

"But this same acid has more affinity with alkaline than with metallic substances, so that by the intervention of the former in the compound salts, which I have just mentioned, the acid is forced to let go the metal, to unite itself with the alkali.

"The metallic substance being then disengaged from the acid, which kept it in solution, it will precipitate and render the liquor opaque.

"If then wine is impregnated with litharge, its acid will keep the litharge dissolved; but, if I pour into it an alkaline liquor, it will force the acid to let go its hold to unite with it; and the lead, being no longer kept in solution, will appear again, trouble the liquor, and at last precipitate itself to the bottom of the glass.

"If there is not any lead or any other metal in wine, the alkali will unite itself peaceably with the acid, and there will not be any precipitate."

Other authors have thrown so much light on the subject, and unveiled practices so essential to be known, that to enable every body to be on their guard against their baleful effects, the substance of their remarks cannot fail here of being welcome to the reader.

White lead, litharge, and minium, are insipid; but if any of these ingredients be boiled in distilled vinegar, it dissolves, crystallizes itself, and produces one of the sweetest substances in nature, known by the name of saccharum saturni, or sugar of lead. This property of lead to get sweet, when dissolved with acids, has made it valuable to those wine merchants, who being more mindful of their own profit than of the lives of their customers, make no scruple of restoring sour wines by

* On the contrary, it has been ascertained, that vinous acid owes its origin to the oxygen gas, which wine absorbs from the atmospherical air; yet notwithstanding this error, the general inference of the argument is not less just.

mixing with them a quantity of white lead or litharge. I believe that this adulteration is punished with death in some parts of Germany ; and it were to be wished that every where else it were liable to the severest penalty.

In 1750, the farmers in general being astonished at the great quantity of spoiled wine brought to Paris to be converted into vinegar, they redoubled their exertions to discover the cause of the enormous increase of that article. For some years before 1750, there had been brought in annually about 30,000 hogsheads, instead of which, the quantity of the same liquor, for forty years before, did not on an average exceed 1200 hogsheads a-year. They found that several wine merchants, who called themselves vinegar merchants, bought these sour wines, which were rendered still more sour by the custom of pouring into each hogshead six quarts of vinegar before they were sold, and which, after they had restored their taste with litharge, they sold as merchantable wines ; for this substance not only corrects the sourness of wine, but as it gives body to such as is weak, it affords an additional temptation for using it. This ingredient does not excite any fermentation.

An edict was published in France, dated February 27, 1787, prohibiting the adulteration of wine or cider with litharge, white lead, or any preparation whatever of lead, under a penalty of a thousand livres (40l.) for each offence, and in case of insolvency, of being condemned to serve on board the galleys for three years.

The reader may judge to what danger the consumer of such liquors is exposed, from the following fact :—

“ An evening one of my neighbours laid in a trough a few brushes daubed over with white lead paint ; several ducks were in the habit of going to drink out of it, which were all found dead the next morning.”

There is no preparation of that metal, which when taken internally, is not destructive. The use of it is not confined to wine and cider, as villainy is become more knowing in the art of imposing, and these fatal discoveries are by no means unknown among us. A nefarious mixture of these poisons with spirituous liquors, of which they improve the taste and calm the heat, hurries away prematurely to the grave a great number of useful citizens. The strongest and most healthy constitutions, are by no means proof against an immoderate use of the best spirits ; but, when they are impregnated with lead, which is often the case, the delinquents, who made such a mixture, seem to be fit objects for the most exemplary punishments.

It is melancholy, that among us, no measures are taken against the guilty practices of these public assassins. If the police is ignorant how to unravel this mystery of iniquity, it is then, if ever, that an enlightened and protecting legislature ought to interpose.

The following receipts will enable one to discover, what drinks are adulterated in the manner I have mentioned. They may

may be analysed several ways, but that by means of hydrosulphur of potash succeeds perfectly well, and is easy to practise.

Put in a sea-shell, or a tobacco-pipe, half a drachm of flour of sulphur, and a drachm of salt of tartar; combine them together, by melting them over a strong fire, and then pour this mixture* into half a tea-cup full of boiling water. After it has settled, decant it clear into a bottle, and seal it hermetically. It is well done, when it takes the colour and consistence of oil of olives.

A few drops of this compound, poured into a glass of the liquor suspected of fraud, will show if there is any lead in it, and in what proportion. But, as this preparation also precipitates the particles of iron, it is sometimes important to draw a distinction between liquors impregnated with this latter metal, which has nothing unwholesome in it, and such as contain lead, copper, or arsenic; the following receipt is practised with success:

Fill a crucible with equal quantities of oyster shells, and brimstone in powder; raise then the fire immediately by means of bellows, so as to keep the crucible to a white heat for a quarter of an hour; as soon as the mass has got cold, reduce it to powder, and put it in a vessel well stopped up.

Whenever any of it will be wanted for use, put two drachms of vicam of tartar in a strong wine bottle; fill it with water, and make it boil for an hour; and then when it has got cold, stop it up, and shake it for some time. Afterwards, when it has settled, decant it clear into ounce vials, with twenty drops of muriatic acid in each, and then cork them well with wax and turpentine.

A fourth part of this preparation poured out with three parts of the liquor to be analysed, will point out the least quantity of lead or copper by a black precipitate; and of arsenic by a yellow precipitate, but will have no effect upon iron. By saturating the precipitate with salt of tartar, if the liquor contains any of this latter metal, it will immediately turn black, but that which is pure will not change. Liquor, impregnated with particles of copper, will in a short time tinge polished steel with a yellow colour. A few drops of carbonate of ammonia will produce a fine blue.

* As there are often pyrites, and always heterogeneous parts, in spring water, it should be distilled, or else rain water is to be used.

CHAPTER XVIII.

How to prepare Casks—The Danger of cleaning them with an Iron Chain—The Manner of Burning Brimstone into them.

IT is well known, that the vessels which are to contain cider should be properly seasoned, as, without this circumstance, all the trouble which has already been, or which might afterwards be taken, would be to no purpose.

When a cask is new, it is proper to prepare it, previous to any cider being poured out into it; the way of doing it is, after it has been washed with cold water, to throw a little salt water into it, and to shake it in every direction, and then draw it out; a few quarts of new cider must afterwards be boiled and poured hot into the cask, which must be bunged, then shaken, and let to get cool in it.

The best way to keep casks which have been used well tasted, is to work them as soon as they are empty. Such as are to be laid by, must be rinsed clean, have brimstone burnt in them, and then bunged. It is easy to ascertain if they are clean, by holding a lighted candle down the bung-hole, while one looks alternately through holes made at each end; it is thus that the inside is perfectly seen. If they have been neglected to be washed at the time I have mentioned, a few buckets full of water must be thrown into them, along with a few pebbles, and then shaken in the ordinary manner. These pebbles operate in a cask like small shot in a bottle.

By using an iron chain, there is a risk of spoiling the cider; the friction not only detaches a great number of particles from it, but it is very possible that it should break. This is what happened to a certain grower, who, after having tried to no purpose to get it out of the cask, lost the liquor which he poured into it, through the iuky colour which was communicated to it by the iron. A strong lye of wood ashes thrown in boiling hot, takes off a vinegar taste. The cask is then bunged immediately, and violently shaken, and it is afterwards set on one end for half an hour, and suffered to get cool on the other. Quick lime and water may also be applied to the same purpose.

If

If the lees, by being kept in too long, have become putrid, and infected the cask, the inside of it must be burned with straw. The coal, which is formed by the wood being burned too much, far from being at all prejudicial to cider, tends, as I shall soon show, to keep it pleasant. When a cask is thus become infected, it would be in vain to attempt to cleanse it with lye or lime, as those ingredients would not have any effect upon it. There is no room to expect any thing from muriatic acid gas impregnated with oxygen, as it does not succeed in such a case; at least, it has failed in the experiments I have made at different intervals, with a view to ascertain the fact.

In some parts of Normandy, it is the custom to take off the heads of their casks, and sweep them as soon as they have been drunk out. This is the best means to make sure of their being clean; and the advantage which the subsequent liquor derives from it, amply indemnifies for the additional expense.

They will be fit for use at any time they may be wanted, by washing them again, unless previously it be thought desirable to burn brimstone into them. This operation only affects the taste of cider for a short time, and the vapour of the brimstone, by its property of absorbing a great deal of carbonic acid, diminishes fermentation.*

It is done by setting fire to a rag, an inch wide, and from eight to ten long, daubed over with brimstone for three-fourths of its length. It is then let down the bung, from which it remains suspended, and is stopped up in; the cask in such a manner as to prevent the vapour from escaping, an hour or two after the bung is removed, and the liquor poured in.

* Fourcroy, Elem. of Chem. Vol. 1, 2d, Part. Ch. IV.

CHAPTER XIX.

Of the Fermentation of Cider newly pressed out—And of the Time of Racking.

IT is not sufficient to abstain from mixing water in cider, to enable it to be of a good quality. It is true indeed, that the juice of very fragrant fruit, does not require the precautions which are indispensable to that which is pressed out from the common sort of fruit. It is, however, a safer and infinitely surer way, to rack it all indifferently before it has fermented, that it may be purified from its sediment, which would seldom fail to give it a vinegar taste.

To render it nice and pleasant, the cask must be kept undunged, with two or three inches in it empty, that a greater part of the bulk of the liquor may be exposed to the action of the air, and because the revolution it is about to undergo will increase its size. When it is poured out in a small stream from one vessel into another, the air, by striking it in more of its parts, will produce, in this respect, more considerable effects. By only pouring out a part of the contents of a cask, the working of the cider remaining in it, will be delayed for some time. It is probable that this effect is derived from the same principle; namely, from the diminution of the liquor, which gives room to a new atmosphere to introduce itself.

It is impossible to lay down any precise rules as to the number of rackings. This process, which makes the cider pleasant, is done at the expense of its strength. By repeating it for the last time about the end of February, and exposing it again in a vat to the action of the air for two or three days, it will render it of a better taste.

It must be racked in the interval between the workings, as otherwise it would remain thick for a long time, and would become sour or vapid instead of throwing off its impurities. Many of the English growers will watch night and day with a

view

view to avail themselves of the critical moment for this operation. It is but seldom that cider wants yeast in this climate to excite it to work. The fermentation is retarded by the cold, and when it is hurried on by the heat, a part of the spirit is carried off with the gas.*

* Gas is to be found in the three kingdoms of Nature. That aëriform substance, which, in its fixed state, constitutes an essential part to the development of seeds, by being susceptible of detaching itself from them through the action of fire or fermentation, affords a method at once quick and easy to ascertain whether they are good or bad. If they retain their vegetable faculty, after being swollen by the expansion of the gas and moisture they contain, they will burst with a noise. If, on the contrary, the texture of their organisation is destroyed, they will burn without any explosion. One may immediately distinguish which seeds may be depended upon, by setting them on glowing embers, or a shovel nearly red hot.

CHAPTER XX.

Phenomena produced by Fermentation—Roxier's Notion concerning the Analogy between Wine and Cider—A Parallel between these two Liquors.

IT is easy to judge, when the gas detaches itself from any liquor whatever, or, in plainer language, when it works. If one will put his ear to the bung hole of a cask, he will hear a hissing noise; and, if a candle is applied to it, the repulsion which the light will experience, will ascertain the degree of the working.

The wonderful effect of fermentation displays itself, independently of any mechanical cause, in all vegetable and animal substances, changes their taste and properties, and renders drinks heady.

Fermentation commonly appears in cider two, three, or four days after it has been pressed out, and lasts from a fortnight to six weeks. It ceases then, begins anew, is extinguished a second time, then returns again with new obstinacy, and at length becomes weaker, till the carbonic acid gas, contained in the liquor, is dissipated, and its saccharine particles converted into alcohol or spirit, and it has acquired that roughness, which is found in it very often.

The precise periods of fermentation are uncertain, as the motion of the liquor, the state of the atmosphere, the condition of the fruit when it was pressed out, and even the vessel itself, either increase or diminish it, hasten or check it. What I am going to relate, is a striking proof of this latter circumstance.

A cider merchant having been, in a great measure, compelled to use tierces in preparing his cider in a plentiful year, was surprised to find it afterwards of a better quality than that which had been put in casks of a larger size. I have received this circumstance from himself. The effect was manifest, though he was ignorant of its cause; here it is in a few words:

The fermentation is never violent, but where fluids as well as solids (manure for instance) have been got together in considerable

siderable quantities; the tierces, of which this person had availed himself, restrained the liquor within suitable bounds, and moderated its impetuosity. This is, in all probability, one of the most simple expedients that can be had recourse to in making cider, to preserve it its sweetness.

There are some writers who reason on the making of cider, as on that of wine.* But they have a wrong notion of the subject.

1st. Tartar, which is one of the bases of wine, only exists in cider, in an imperceptible degree.

2ndly. Wine generally ferments before it has been separated from the must. On the contrary, the juice of the apple must be pressed from the cheese, and in part clarified, before it is left to ferment.

3rdly. The fermentation of cider goes on slowly, and is at no time so rapid as that of wine. In the former, a candle gives but a faint indication of it in a vat, even at the time of the tumultuous motion; while, on the contrary, the vapour of the trodden grapes is sometimes so powerful as to cause those to faint who go into the press room.

4thly. Wine in a state of fermentation can produce, according to Chaptal, from 12 to 28 degrees of heat, by Reaumur's thermometer; but cider seldom rises above the temperature of the atmosphere.

5thly. The fermentation of wine (I mean that of the first period) is only for once, or is very weak if repeated; while that of cider, being renewed at different intervals, will exist for months.

6thly. The lees of cider are more copious, and require a longer time to settle, than those of wine.

Lastly. To adapt cider to most tastes, it ought to retain a certain quantity of carbon, combined with a part of its saccharine quality, which circumstance is most commonly opposed to the nature of wine.

As these liquors therefore produce different results in their most essential particulars, it is obvious that they require an opposite management in making. There is scarcely to be found any analogy between them, but in the characteristics of the fermentations they experience, the vinous, acetous, and putrid, fermentations, and in that the trials to make them retrograde, have constantly failed in the one and in the other. Consequently the resources of art should be directed to correct the bias of cider to get sour, to establish the equilibrium of its elementary parts, and to keep them within certain bounds.

* Rosier Cours Complet d'Agriculture, tome III. p. 43.

CHAPTER XXL

Of clarifying Cider, and exposing it to the Action of the Air—A Rule to judge of the proper Time of the last Racking.

THE principal things on which the fineness of cider depends, are the clarifying it in the very beginning of the process of preparing it, and exposing it to the open air. From these rules is derived the necessity of racking it, from which arises another practice, which to its being simple unites the valuable quality of diminishing the work and attendance upon it. It is to lay it in tubs from twenty to thirty inches deep.

It is surprising, that so simple a method, and in use for beer, should not have been followed sooner. It is only within these few years, that a few individuals have made an application of it to cider. This practice is as safe as it is cheap. Pipes, puncheons, and tuns, may afford two tubs each.

The time that cider must remain in them, is to be determined from the ripeness of the fruit it was made of, the nature of the vessel containing it, the state of the air, and the temperature of the atmosphere.

The critical time for taking it out of the vats, will be pointed out by its clearness, the separation of the dregs swimming at top, and from bubbles having ceased to rise to the surface.

Some persons pour it out of the vat three or four times, while others let it work there, and are guided by the symptoms I have just mentioned. There are some also who take off the pellicle at the surface, or scum of the lees, as soon as it is formed,* and others allow it to fall to the bottom at the time of racking. But the management must be various according to the nature of circumstances, and the object the grower has in view.

Lavoisier found by his experiments on the fermentation of sugar by means of yeast (V. tome 1. p. 145), that the scum was no more than the yeast which had detached itself. By removing it therefore the first time the cider is poured out of the vat, it will, in a great measure, annihilate in it the cause of its violent fermentation.

It has been pretended by some, that by filling the vessel, and bunging it hermetically, cider will come to perfection without having been worked, and preserve its saccharine quality. This theory presents an almost insurmountable difficulty. It is sufficient, that there should be ever so little air remaining among the liquor, and it is almost impossible that it should be otherwise, or that the latter should communicate ever so little with the atmosphere, to awaken a fermentation, which, by the elasticity of the fluid vapours, will not fail to disengage itself and burst the cask.

Last year I filled a dozen of bottles with new cider, and then corked and sealed them well; and, having chosen a cool place, I placed them there, standing, that in case there should be afterwards an internal pressure, the sides of the bottles by being closer, might also be the better able to resist. In less than a fortnight all the corks had burst. It is then to be presumed that a violent explosion will take place where the cider would be put in a mass several hundred times larger, retained by a force almost the inverse of its quantity, and confined in a vessel of porous materials, subject to absorb the moisture, and afterwards by drying, to admit the air. If any thing could prevent it, it would be pouring the cider as soon as it is pressed out into the cask, and then immersing it in water. Even, if this expedient should happen to succeed in point of safety, yet it could be but partially adopted, and by few proprietors. The only advantage which the liquor, now become disgusting to almost every body by its sweetish taste, would ultimately derive from it, would be that of being proper to make stronger vinegar.

It is then better to abide by a practice, supported on the principles which I have just explained.

New cider, after it has been exposed to the air for some days, or some weeks, as it approaches more or less to its perfection, becomes insipid, and seems to have lost all its strength. However, if it has been extracted from a good fruit, and clarified according to the rules we have laid down, when it has been put in a clean cask, it will recover and improve itself, and get brisk and pleasant. Having disengaged itself of its gross particles by the stronger fermentation, it acquires by the gentle one, that fineness, those qualities, and that exquisite taste, which sometimes put it in competition with the most celebrated wines. This lowering in the working, when one comes to the latter part of the process, requires a particular attention.

It is to the want of observing this rule, that is to be attributed that dull and almost continual humming noise, which the new cider experiences in the casks. This is the cause, that in a very short time a delicious liquor is converted into a beverage worse than indifferent.

As this part of the process depends on the eye, assisted by good rules, it is difficult to specify the precise indications by which.

which the degree of the fermentation may be ascertained. With a view, however, to elucidate this important point as much as lies in my power, I think I may lay down the following observations before the reader, as to be relied upon.

When about the end of the work, some of the cider is poured out into a glass tumbler, if the surface gets covered with a light foam, or bubbles fasten to the sides, there will be reason to conclude, that it still contains fermenting particles, from which it should be disengaged. It may then be exposed to the open air in a vat, if it was in a cask, or if it was in a vat, it must be poured out from one into another. On the other hand, it may be depended upon, that it is highly essential to its keeping good, that it should be poured in where it is to remain, previous to the surface of the tun or the vat it was in getting covered with a slight pellicle. Without attending to the former particular, it would turn sour, and without the latter, it would get flat. But the surest sign I have yet observed, is when the liquor is become perfectly quiet, and begins to reflect objects,

CHAPTER XXII.

Of the Use of Quick Lime and Charcoal.

THE ancients put plaster in the vat in which they made their vintage work, instead of which the moderns use lime.

"Before putting the vintage in a vat, (says Chaptal, in his Treatise on Wines,) the precaution must be taken of cleansing it with the greatest care. For this reason, the vat is worked with lukewarm water, then rubbed strongly, and its sides plastered over with two or three layers of lime. This plaster has the advantage of getting saturated with part of the malic acid, of which there exists great abundance in wine."

If this latter precaution is necessary for wine, with much stronger reason is it so for cider, under certain modifications.

As quick lime, by getting combined with carbonic acid gas, is turned into chalk, and has also an affinity with malic acid, which it absorbs, there is every reason to suppose, that whoever first imagined to transfer the use of it to the making of cider, did not do it by chance. The following experiments will show in what respects lime affects this latter beverage.

First Experiment.—Having poured out a quart bottle of very brisk cider on three ounces of pulverised quick lime, the latter was instantly deprived of its gas.

Second Experiment.—Half a pint of water, artificially impregnated with carbonic acid gas, commonly known under the name of Seltzer Water, of the double strength, which I poured on an ounce of quick lime, gave me the same result.

Third Experiment.—An ounce of quick lime rendered completely vapid, in less than a quarter of an hour, half a pint of very strong cider vinegar.

Fourth Experiment.—A pint of rain water, impregnated with two ounces of sugar, and mixed for several days, with an ounce of quick lime, did not lose any of its sweetness.

Fifth Experiment.—An ounce of spirits of wine poured on a drachm of quick lime, produced no effervescence, and several months after this mixture dissolved, wax as before.

It is evident from these experiments, that a small quantity of quick lime does not communicate any bad taste to the cider, and

and that it absorbs its carbon and acid, (qualities which it almost always contains to excess), without affecting either the saccharine part, whence the spirituous principle arises, nor that principle when it is already formed.

It is to be laid down as an invaryable rule, that in no case whatever, the first fermentation of cider should be impeded. As it works less violently than wine, it stands in need of all the resources with which nature has supplied it, to divide the viscous particles of which it is composed, and which can only be separated by this operation. The lime therefore, must not be introduced till after the cider has undergone a complete fermentation, and been racked. As this ingredient is merely employed as a corrective, it is proper for one to be circumspect in the use of it, and rather to use too little than too much. I believe that a pound and a half, or two pounds of well burned quick lime, reduced to powder and sifted, is sufficient for each hogshead.* This is the method, which after several trials, I have lately practised on above a hundred hogsheads, which have turned out to be excellent.

It is another advantage resulting from the use of lime in cider, that it diminishes the trouble which a series of fermentations would occasion, and gives room to its undivided parts to precipitate. After these have been discharged, that is, three weeks or a month after the application of lime, the liquor should be racked. It is not yet so attenuated, but that it has carbon enough remaining to create a good gentle fermentation.

As the acid predominates more when the fruit is unripe than when it is ripe, and in rainy seasons more than in dry seasons, it follows that cider requires then more lime. In other respects, people may make themselves easy on the effects of this mixture. The worst, I think, which could happen, would be that the drink would perhaps be opening with some constitutions.

As one of my casks, whose inside had been burned, kept the cider remarkably fine, it occurred to me, that charcoal might, perhaps, contribute to that circumstance. As I knew that this substance purified putrid water, and that when thrown into the pot, it took off from fish and flesh in boiling a tainted taste, I wished to try whether it would not also succeed on cider. As I had then a vat full of a very bad taste working, I had a certain quantity of powdered charcoal put in a bag, and thrown in; in about three weeks the same cider was become clear and vinous, and might be reckoned among the best. I have ever after put some in all that I have made, and it has constantly turned out to be of a better taste, and has taken less time in discharging itself of the dregs, than the

* The lime should always be in powder, as it is difficult to slack it in lumps. The stone trough affords great facilities for grinding it fine, which is absolutely necessary. In a few hours one may prepare as much, by this means, as will be wanted for the whole year.

other. With the view to avail myself of an opportunity that occurred to decide this point incontrovertibly, I ground the apples which had been set aside and thrown in a heap ever since the beginning of the season, and which emitted then an offensive smell. I extracted juice enough from them to fill seven barrels of fifteen gallons each, which I treated in the following manner: I put in the first barrel nine ounces of powdered charcoal, enclosed in a long slight linen bag; in the second, seven; in the third, six; and in the fourth, five; and reserved the latter three barrels as objects of future comparison. At the end of about a fortnight, the cider of the first barrel totally lost its bad taste. It was perceptible in the others, in a gradual progression, from the second to the fourth; in such a manner, that there was still a sensible difference between this last and that which had been kept for comparison.

The quantity of charcoal put in the first barrel, would amount to 2lb. 4oz. for each hogshead. But as ordinary cider differs considerably from that on which I made the above experiments, I think, that about a pound and a half would be sufficient. In other respects, I cannot foresee how a greater quantity could be hurtful. Charcoal, as it has just been shown, is analogous to that liquor. All ciders contain some tainted particles, as the fruit from which they are extracted is never from defects, whether these were contracted on the tree by the fall of the fruit, by its being removed from one place to another, or by any other circumstance whatever; and, therefore, I presume that charcoal can be serviceable to the best. Every vat-full requires fresh charcoal, as, by using the same a second time, I have observed that it had lost, in a great measure, its property of improving the cider.

The charcoal must be used before the lime, though not in such a manner, as that they should mix, as they neutralise each other. I have not perceived that charcoal had any effect on cider when lime had been previously used.

It would be easy to conceive, according to received opinions, how cider, whose gas had been exhausted by the stronger fermentation, might derive some advantage from charcoal; but it would be desirable to know, why that which is saturated with the former, is improved by the addition of the latter. Perhaps the cause might be traced to the oxygen which it draws from the atmosphere during combustion. Be it however as it may, the experiments I have just stated, place the propriety of using it beyond a doubt.

CHAPTER XXIII.

Of Filtering the Lees—The Theory and Manner of making Vinegar.

The quantity of the lees may be diminished, and a good drink extracted from them, when they are poured in by themselves, and half a gallon or a gallon of brandy is added to each hogshead. When they are filtered through linen bags, in the shape of an inverted cone, supplied with a hoop at top, or through cloths held up in such a manner as to form a hollow, they will also afford an useful residuum, which, when added to other liquor, will very much improve its quality. It is indispensably necessary, that this residuum should be perfectly clear, as otherwise the liquor to which it would be added, would become hard to clarify. A barrel filled with straw, with a hole at bottom, furnished with a bundle of reeds, after the way used in making the hick, or covered in the inside with two or three inches thick of sand, may do for such persons as want other conveniences. As soon as the passage through these materials is choaked up by the thicker lees, it is plain that a fresh supply must be put in.

It is thus that the lees of old cider can be turned to profit, by using them for making vinegar. This latter preparation, on account of the use of it in several trades, would be susceptible of being formed into a branch of our commerce with the mother country. Above all, it is now become valuable, through the increase of the royal navy; on board of which the consumption of it is almost incredible.

Parmentier describes an easy way of making it. "The inhabitants of the cider and perry districts (says he) make vinegar with those liquors. It will be sufficient, for this purpose, to dilute in a cask of 200 gallons* about six pounds of sour yeast, made with barn and rye flour, which is first diluted with warm water, and then poured in at the bung. After having stirred the whole of the contents with a stick, it must be let alone, and in about a week for the most part, the vine-

* Original *buit cents pinte*. The pint of Paris weighs two pounds, which is equal to our quart.

gar will have acquired sufficient strength.* It is indispensable to rack it as soon as it is made, it being more subject to get dead than wine vinegar."

There are several of our fruits, whose juice when fermented, can make tolerable vinegar, as their saccharine mucilage naturally disposes them to it. Gooseberries treated after the following receipt, afford vinegar of an exquisite taste and fragrant smell:—

Bruise a certain quantity of the fruit well ripe, and mix with it a few raspberries; boil water, and after it has got cold, put three parts of it with one of the juice of the gooseberries. Twenty-four hours after, filter this mixture, and to each gallon of it add a pound of brown sugar. In nine or ten months it will be fit for use. Its strength may be increased by exposing it to the sun.

The making of vinegar requires,

1st. An exposure to the action of the air. †
2ndly. A certain degree of heat, that is, from about 65 to about 85 degrees of Fahrenheit's thermometer; but a greater heat would prevent it from making.

3rdly. A saccharine principle.

4thly. A mucilaginous principle, and if it is possible, some mother, or pellicle, previously formed on the vinegar, or a small quantity of vinegar already made.‡ The liquor from which the vinegar is to be made should be clear, and the vinegar itself kept in a clean vessel. It is subject to lose its fragrance, and to get impaired, if it is exposed for any time to the air. Scheele, a celebrated chemist, thinks to have discovered a very simple expedient to keep it good: it consists in making it boil for a few minutes in a well-tinned pot; to prevent the terrible effects of verdigrease, or in filling glass bottles with it, and placing them on the fire in a pot-full of water. When the vinegar has boiled for a quarter of an hour, it is taken off; and, according to him, when it has been thus warmed, it will keep for many years, though exposed to the open air.

It is obvious, that cider, with which a great deal of water was mixed at the time of making, cannot by itself make good vinegar; but it follows from the third rule, that such vinegar may be rendered better by making it work again with sugar, honey, raisins, and the like.

* It is understood, that the process takes place in summer, or in a warm room.

† To impregnate the greatest part of bodies with oxygen, and in general almost all simple substances, there is only need to expose them to the action of the atmospherical air, and to keep them up to a suitable degree of heat.—*Lavoisier, tome I. p. 204.*

‡ For these reasons the verjuice of crabs or sour grapes, is not, strictly speaking, vinegar; and, in fact, it is made use of for very different purposes.

CHAPTER XXIV.

Of Bunging the Cider—A method of quickly reducing Swellings from Bruises.

IT has not yet been ascertained, which is the precise time when it becomes indispensable to bung the cider. The best, I believe, that can be done, is to seize the critical moment which precedes the formation of a pellicle on the surface, and above all, not to wait till it gets sprinkled with bubbles, as they are the signs of decomposition. On the other hand, when it is done too soon, the great quantity of gas remaining, will force the liquor to make itself way through that part of the casks which opposes to it the least assistance. This is the most ordinary cause of leakage, though the vessel might have been originally sound.

This accident may be prevented by boring a small hole near the bung, with a gimblet, to give a vent to the gas, that might detach itself from the mass, and which is to be stopped up as soon as there is not any room to be afraid of its effects. In the same manner, a small piece of lead, shaped like the valves of a pump, may be used, or a short light nail with a large head, as the internal pressure will easily overcome such obstacles as these. It will be advisable to take these measures as soon as the cider is bunged.

As soon as the internal pressure has disappeared, every access to the external air must be prevented, and the bung must be daubed over with a compound of clay and cow-dung, or what is perhaps preferable to any thing else, it must be covered with a hand-full of wet sea-weed ashes. This latter ingredient is sensible of the least variations in the atmosphere, and most commonly keeps moist.

As it is necessary in preparing cider, that it should be very much exposed to the air, so after it is once made, it cannot be kept too much from it.

Though strictly speaking, this work has nothing to do with the effects of the air, but with reference to its subject matter, I hope that the reader will show some indulgence to the following

ing digression, considering the advantage that may be derived from it, in many domestic cases, and especially in one, which happens but too often; I mean with regard to bruises.

The reader will easily form an idea of it, from the facts I am going to state, and from the circumstances by which they were occasioned.

One of my servants having had a horse-kick in the forehead, it produced a swelling of an alarming size, and though it was free from excoriation, it caused him a very sharp pain, and an excessive heat. As I had no room to think that the cranium had suffered, it came into my mind, that he might derive some relief from evaporation. For this purpose I got a glass of gin, the only spirituous liquor I had then in the house, a feather with its vanes, and a pair of bellows. I dipped the feather in the liquor, and bathed the affected part with it, while another person kept blowing upon it, and I had the pleasure to see, that in about a quarter of an hour the swelling was diminished, and that it had totally disappeared along with the pain, at the end of thirty-five or forty minutes. This experiment has been repeated on several occasions, nearly similar; and has invariably been attended with the same success.

I have also met with an occurrence, which enabled me to make a trial of this remedy with respect to bruises, when there was a wound.

One of my labourers had his upper lip cleft with the blow of a mallet, so that he could pass his tongue through the aperture made by the wound. A quarter of an hour after the accident, I sponged the part with spirit of turpentine, the first drug I found at hand, and then with spirit of wine; at the same time that I had the wound blown upon with bellows. In twenty or thirty minutes, the swelling had vanished, and in less than half an hour more, I judged it was time to terminate the operation. The re-union of the parts was effected almost immediately without the help of a plaster or ligature; and there has only remained a scar hardly perceptible. The patient was eased astonishingly by the wind, which to have its full effect, should be kept up strong and even.

This manner of cure is evidently preferable to all the ordinary ones. It is so simple that every body may perform it; is perfectly clean, presents no alarming apparatus, is not expensive, and is attended with no danger. In short, the things necessary for its application are such, as are to be found in almost every family.

The concentration of cold, by bracing the relaxed fibres, cools the fevers or local heat, lessens the swelling, dissipates the pain, and an immediate cure is the consequence. The evaporation which takes place by the rectification of spirits, combined with the agitation of the air, can be excited to such a degree as to for mice, even during the heats of summer.

Though gin may be used, yet strong brandy, spirit of wine, and ether especially, will produce a quicker and more complete effect. This is also what I have often been able to ascertain from my own observation.

In case any accidents should happen, such as I have just mentioned, when it would be impossible to procure spirituous liquors of every kind, water might be used simply with the blowing.

This remedy must be applied immediately after receiving the injury; for when the part has once turned black, it is too late to attempt it.

In the hands of a judicious practitioner,* it might be successfully employed in some inflammatory affections. Burns have already afforded a proof of the efficacy of the same treatment.

According to theory of the present day, the use of it might be advantageously extended to relieve the patient during the paroxysms of the gout

Mr. Le Couteur was not mistaken in his hypothesis. It has since been applied to the cure of the yellow fever, in the West Indies. If, however, the efficacy of this principle should hereafter be more fully established, Mr. Le Couteur is undoubtedly intitled to the right of prior discovery; as his work had appeared sometime before the communication of Dr. Ralph Cumming, of the Naval Hospital, at Antigua. That gentleman addressed a letter, dated October 24, 1807, to the merchants at Lloyd's Coffee-house, on the subject of a cure of the yellow fever. We extract the following passages: "I have discovered, that sponging the head, body, and limbs, of a patient, on the first attack of fever, with rum, or other ardent spirit, is the most effectual remedy which can be used. The principle on which it acts is evaporation, and the degree of cold produced will be in ratio proportionate to the strength or volatility of the spirit employed. It has a two-fold effect at the same time, that if it refrigerates the almost burning body, it excites, by its stimulant effect on the skin, the perspiratory organs into action, and soon produces perspiration. All the naval surgeons who have visited English Harbour, and have had the fever on board, have used the remedy recommended by me; and are delighted with its speedy and salutary effects, from whom, as well as myself, documents have been transmitted to Government."

The doctor afterwards directs, "That when a person is seized with pains in the head, and with a hot skin, &c. in tropical countries, he is to be stripped naked, exposed to the action of the air, and be sponged all over with spirits, till the skin is cool, not suffering the pulse to fall below sixty; he is then to be put to bed, and to have a purge, and an opening injection or clyster. As often as the fever returns, the sponging with spirit is to be resorted to. Bleeding, in proportion to the strength of the patient, will be necessary, which should never be deferred twenty-four hours after the first attack." The doctor adds, "I hope, after this information; that people destined to the West Indies, will leave home with greater fortitude, and not waste their money on the quackeries of the day, and fill their trunks with yellow fever remedies. When the skin is moist, and perspiration flows freely, the spirit is no longer to be used; after the perspiration has flowed some time, which may be supported by lemon, grass-mint, or common tea, the cure is to be completed by an infusion of quassia or decoction of bark; and former habits will by degrees be returned to."

CHAPTER XXV.

Of the Disorders of Cider, and how to Cure several of them—How to Colour it, to Purify it, to pour it out from one Cask into another, to Load it, and to Carry it.

BUT to return from this digression to the treatment of cider.—Sometimes, in consequence of warm weather, it becomes disgusting, gets clammy, and runs like oil. By tracing the cause of this, it will be easy to learn how to apply a proper remedy.

As this defect is owing to the liquor not having been sufficiently attenuated in working, it will be desirable to use all sorts of things, containing a superabundance of gas; such as sugar, raisins, vine leaves, chalk, and the like. It must then be well shaken, have a little acid added, and be poured out into another vessel.

There is some cider which improves after it has been tapped for a few days. The gas which had previously remained at the surface, had given it a harsh kind of taste, which is generally removed after it has been in draft some time. It is only after this elastic fluid has got combined with a certain portion of the external air, that the liquor has acquired all the goodness of which it was susceptible. This is an additional reason for not neglecting to expose it to its action at the proper time.

As to the mouldiness on the surface of cider, which is known in this island under the name of the *Flowers of Cider*, it is, in all probability, owing to a decomposed liquor, or to imperfect fruit. In either case, as the principle itself is degenerated, it no longer admits of any remedy.

Small cider, when kept for the whole year, gets impaired. By grinding it again, in the proportion of about half a hogshead for each trough-full of apples, it will be so far restored as to make a good beverage. This fortunate change also takes place with cider originally good, but which had been put in a badly-seasoned cask. The badness it had contracted there, gets so completely fixed in the cheese, that cattle, be it ever so hungry, will not touch it. This practice succeeds equally in correcting that which runs, as well as that which has been impaired by length of time.

Besides the process of using charcoal, which I have already explained, it follows also from this one, that very bad fruit may

may be turned to a good account. The apples which had been thrown aside in sorting, and then ground apart, will, no doubt, make a detestable drink the first year; but, by means of this process, it may be so far corrected, as to be rendered drinkable for several months. By adding to it some ingredient, that will excite it to work, it will be easy to convert it into vinegar.

It is proper at all times, that unless the apples were gathered very clean, they should be worked before they are ground. The juice is thereby rendered more pure, and the washing should not be omitted, especially with regard to bad fruit.

When cider has got too sharp, a small quantity of malt thrown in, will diminish its roughness by mashing the acid; lime which absorbs it, is better still.

When it has been in draft a long time, it gets flat. Put in a vial, two-thirds full of powdered chalk, fill it with water and sulphuric acid, (oil of vitriol) and then apply it in such a manner, that the carbonic acid gas, which will be disengaged from it, may be discharged into the cask. The liquor will thereby partly recover its original briskness. The cask must be sealed up hermetically during the operation, and for some time after. Salt of tartar mixed with chalk, will have nearly the same effect. These things, however, are rather matters of curiosity than of an economical use. It is probable, that the most eligible way, is to pour it out, and fill another vessel with it.

Cider requires to be kept in a cool place, rather damp, with a temperature nearly uniform, and to be deprived of the light. It should also, if possible, be far removed from all sorts of filth, be exposed to the north, and be kept quiet.

This last precaution is not less indispensable than the others. I have been myself obliged to abandon a very commodious cellar, which was under my barn. The agitation of the air caused by the motion of the flails, and the shaking of the floor, turned the cider sour.

Brown sugar occasions the same effect on this beverage as on brandy. Melt some of it on the fire with a small quantity of that which it is intended to make more agreeable to the eye, and then by means of a forked stick, incorporate it with the mass of the liquor to be coloured. It also communicates to it a slight taste of noyau. The proportion to be used, is about half a pound a hogshead.

In case the lees should be late in falling to the bottom, their settling may be hastened, merely by means of the white of eggs; or, (after having racked the cider, and put it in a vat) with skimmed milk, and baked sweet apples; the whole being amalgamated together with a solution of isinglass.* Small

* A dozen whites of eggs, with the shells, or about a dozen of baked apples, well incorporated with a pint of skimmed milk, and half an ounce of isinglass, per hogshead.

shreds of white paper, and the chips of the alder, the willow, the beech, and the sweet apple tree, can be used advantageously for this purpose; but those of deal give it a very bad taste.

I have my doubts whether isinglass is proper for clarifying cider, when it is intended to be kept. It is now known, that that substance absorbs astringent, a principle which I think contributes very much to the preservation of the liquor.

The ingredients set down by Miller for clarifying Spanish wines, would in all probability succeed in clarifying cider. The following is his receipt:

Take a certain quantity of whites of eggs, bay salt, and salt water, mix these ingredients together, and pour them into a cask from which part of the wine has been drawn. At the end of two or three days this mixture will clarify that which remains. It must be left to settle for a week, and then racked.

It is said, that gum arabic, powdered fine, is good to make liquors glutant; an ounce of it mixed with cider, will be sufficient for each hogshead.

When it is shifted into another cask during the summer, the heat and evaporation will deprive it of all its briskness. As it has a variable taste in general, while the apple tree is in blossom, it should not be racked at that time.

The loading of casks into carts is very much facilitated by means of a triangle, known here under the name of *Forces*. It is a triangle of spars, of a moderate height, with a rope and pully, by means of which a cask is hoisted and then let down into a cart, which, in the mean time, has been driven under the machine. On account of the cheapness and various advantages of this contrivance, it may justly be considered as very economical in a farm, and the use of it recommended to all growers in easy circumstances.

Cider never fails, when it is removed from one place to another, to throw out a quantity of gas, which often occasions the leaking, and sometimes bursting, of the vessel. These accidents may be prevented, by placing near the bung a small wooden pipe, from a foot to fifteen inches long, through which the air may escape; this will secure the cask, and preserve the liquor.

It may be quieted, during a carriage of some miles, by introducing into it pounded bay salt; a very small quantity will produce this effect. It is after the same principle, that this ingredient, scattered in damp hay, prevents it from heating; a practice very much used in Germany.

CHAPTER XXVI.

Of Brandy extracted from Cider—Facilities to preserve the latter—Of Casks—A Proposal to have false Bottoms to them.

The brandy which might be extracted from cider, such as it is at present, could not form an object of speculation in this island, as long as it has the privilege of exporting it, and that spirituous liquors are so cheap. Indeed, it may be relied upon, that distillation would reduce the raw material to at least one-ninth, and that the liquor not being drinkable, it would consequently remain on hand for the three or four first years. The cellars, the utensils to be applied to that purpose, the fuel, and the expenses of making, would require a capital, which it would be impossible to realise at the most favourable period.

That which is extracted from the apple cheese, or the lees, is of an inferior quality; it has usually an unpleasant smell, and is subject to take a smoky taste.

There are some people who think, that to keep cider good, it should be supplied with other ingredients. Some throw into it broiled beans, others tallow; and, lastly, there are some who put isinglass in it.

When it has been well made, it will keep for several years, and till a certain period, improve in very capacious vessels. However, as brandy is analogous to its nature, about three quarts a hogshead added about the beginning of February, or even before, will enable it to keep, and also oppose a fermentation which would tend to deprive it of its qualities. Gin is good for it, but rum does not agree with it. I do not know any thing equal to a little elder blossom distilled with brandy to give it fragrance.

I have every reason to think, that when the work is once finished, a decoction of the bark of the apple tree, or what is better still, distilled with brandy, would, from its astringent quality, have the effect of keeping the cider longer, while its very pure bitter, and which is analogous to the liquor, would heighten its flavour. This is, however, a conjecture which requires to be warranted by a longer experience than I have yet had,

had, before it may be absolutely laid down as a rule. At any rate, I am convinced, that this process renders it a great deal better able to resist the impressions of the air than it would otherwise have done.

There are some casks, though very often it is not possible to account for it, which keeps the cider particularly fine. Every proprietor who is jealous of his reputation as a cider grower, will not fail after having ascertained them, to mark them, that he may reserve them for the use of the best.

It would be sometimes desirable, that, in rooms not high enough to admit more than one row, pipes and hogsheads should be set on end. This would save room, and, by covering the top of the casks with wet ashes, the evaporation would be prevented. The same management is applicable to those tuns, the liquor of which is intended for domestic use.

As cider is essentially impaired by atmospherical air forcing itself into the cask while it remains in draft, I shall suggest the adoption of the following method, as particularly suited to the use of private families.

Having selected a cask as cylindrical as possible, introduce into it a false bottom, or circular board, large enough to fill up the interior, as completely as is consistent with its being moveable upwards and downwards; set the cask on end, and replenish it with cider. The false bottom floating on the surface will leave a small space empty between itself and the circumference of the cask; fill it up with sweet oil. The oil swimming at top, and sinking gradually with the false bottom, as the liquor diminishes, will prevent external air from coming in contact with it; while the weight of the atmosphere, which presses through a small perforation, opened at the upper part of the vessel, will cause the liquor to flow easily through a cock fixed at the bottom. This contrivance prevents evaporation, and gives no bad taste to the liquor. As the oil is not naturally mixable with it, it may, in a great measure, be saved when the vessel is washed.

It will be proper to provide casks for this purpose, made with staves of a good thickness, and perfectly smoothed in the inside, so as to allow a free play to the false bottom, which, by having the under part lined with cork, will become more buoyant, and require less oil to fill up the interstice. If the staves were thoroughly rubbed over with bees-wax, as floors are sometimes, it would, in a great measure, prevent the cohesion of the oil.

In tasting the cider of a cask, only a little should be drawn. In this manner is avoided the breaking of the pellicle, which nature has providentially spread over its surface, so as to cover the mass against the attacks of the air. For want of attending to this particular, that subtle fluid will insinuate itself through that opening, and attack the liquor in spite of every subsequent precaution.

It is indispensable to fill the vessels again from time to time,

CHAPTER XXVII.

The Time to Bottle off Cider—Effects of Frost upon it—Processes that make it very Spirituous.

A **CLEAR** dry weather in March is very often chosen to bottle off cider. If it is new, it is to be feared, that, in the course of the following summer, the gas will make the bottles fly. It is preferable to do it in October, when it has then, in a great measure, discharged that fluid, both with regard to economy and health.

Though one may be influenced by the oldness of the liquor, when to bottle it off, yet it is its taste that must ultimately decide this point. The bottle does not change it materially. Some is fit for it within the year, while some other would hardly be so in two. This depends on its quality, the capaciousness of the vessel, the place where it is to be set, carried, and the like.

When the new is bottled off, it is proper to leave about two inches empty, and to defer corking it for at least twelve hours after.

Some persons are in the habit of putting one raisin fig into each bottle, but the gas which disengages itself from it, when it is expanded by heat, is only proper to make them fly.

Hall assures us, in his *Static of Vegetables*, that the gas which is exhaled from a piece of oak of an inch cube, according to the experiment he had made of it, occupies, in an ordinary atmosphere, a space of two hundred and fifty times the volume of the wood.

Those, who know the prodigious quantity of carbonic acid gas extracted from the shells of shell-fish, from chalks, marls, marbles, and all other sorts of calcareous stones; from the nitric of saltpetre; from the oxy-muriatic of sea-salt and manganese, and the like, will, by no means, be surprised at this expansion.

There

There are some persons who set a high value on earthen bottles, as they pretend that cider keeps better in them; but glass ones are preferable to them, as they contain no principle that is dissolvable by the liquor, and that when it is necessary to wash them, their transparency indicates if the inside is clean.

New cider differs in flavour; each has its characteristic, and some want what others have too much of. By mixing them with judgment, they may be so combined as mutually to correct each other.

It is very easy to conceive, that the difference of seasons, soil, exposure, and age of the trees, can increase or diminish the fineness of cider.

Frost concentrates it. By having it exposed to it in open vessels, its watery part gets frozen, and by repeatedly taking off this crust, it improves its good qualities, and infinitely enhances its price.

That which I had an opportunity of managing in this manner some years ago, though it was bottled off the very next spring, never flew. It had retained its sweetness, and acquired some spirit, the frost having taken hold of its gas. I have known some other instances, which were equally remarkable. It is cider of this sort which it is fit to send to warm climates.

The common people, who are almost always imposed upon by appearances, think that old cider can be rendered fine by having recourse to sugar, honey, or raisins. The result is exactly the contrary, as the quantity of gas these ingredients contain, excites it to work, and makes it turn sour. They should not be employed, but when it is intended to use it immediately.

But the case is otherwise during the first period of preparing it, as these ingredients will then tend to render it more generous. Macquer relates, that having extracted the juice of green grapes, which nobody would have tasted on account of the sourness, and then made it work with a sufficient quantity of brown sugar, to remove the roughness, he procured wine from it which wanted nothing but fragrance.

I think that I am entitled, after the experiments I have made with this ingredient, on a few casks of cider, to recommend the use of it, being persuaded, that it is not only in some cases able to correct indifferent fruit in rainy seasons, but also to contribute at all times to produce a beverage superior to the other. The saccharine principle, raises almost *ad libitum* the spirituous part of fermenting liquors. That which, in this case, is produced from the mixture with brown sugar, or with clear molasses, and dry to the taste, bears no resemblance to a syrup. I have seldom ground a more indifferent fruit than that of 1804, and I have almost never made such good cider. I used between three or four pounds of brown sugar a hogshead, but I think that five or six would not have been too much. Circumstances at the time prevented

vented me from diversifying the experiment. What there is certain in it is, that the improvement of the liquor was considerably greater than the expense. One may form an idea of its strength, when it is known that part of the lees exposed to the open air during three weeks yielded some by filtering, which had not the least acid taste. It is then very little doubtful, but that persons who would prepare cider or perry on this principle for the purpose of distilling, would turn it to a good account.

The quantity of mucilage which this liquor contains is so considerable, that it will excite the fermentation of sugar, notwithstanding it may have been mixed with a great deal of water. It follows then, that in a season which was not plentiful, it would be easy to increase the quantity of good cider, by mixing water with it, and a competent proportion of sugar. This practice has perfectly succeeded with me this year.

Chaptal has very well said, "That acid appears to be in an inverse ratio of the saccharine principle, and, consequently, of the alcohol, which is the result of the decomposition of the saccharine part."

The common process of the ancient Greeks and Romans, and which is still observed among many of their descendants, of boiling the new wine, may be advantageously applied to the preparation of cider. It should be boiled as soon as it is pressed out, till the contents have been reduced by about one-half. In general it is sufficient to mix one-third thus prepared, with two-thirds of that which is not; it will ferment together freely. A brown crust, or pellicle, a sign of the best liquor, will soon announce the goodness of this. Some speculative growers boil the whole, and after it has, in a great measure, got cool in a tub, they make it work with yeast. This practice renders it very vinous.

The ingenious Mr. Knight, in his treatise, proposes to evaporate it on the fire to the consistence of a jelly, because that in a concrete state, it keeps for several years, and takes but little room; and might, therefore, be applied, when diluted with a certain quantity of water, to afford an antiseptic drink in long voyages. I must add, that to make it work with yeast, when mixed with a sufficiency of water, would be another way to make up for bad crops.

CHAPTER XXVIII.

Of Old Cider—Of the Effects of Art—Mr. Bellamy's and Mr. Mallett's Letters—Conclusion.

WHEN cider has been kept in cask for five or six years, it loses its colour and sweetness, and gets heady; notwithstanding which, it is most commonly prized by those who make it their ordinary drink.

Some persons like the sweet, and others prefer the harsh; one cannot command peoples' tastes; but in either case, it is indispensable that it should be clear.

Good cider may sometimes be obtained by a concurrence of fortunate circumstances; but sensible people will never abandon the process to chance. Every art has its own rules, and whoever will not abide by them cannot long succeed.

I was going to put under the press the last sheet of this work, when I was informed, that the strength of cider had been found to be in proportion to the specific weight of the apple, or in other words, that the apple, whose pulp was the most solid, yielded the most generous. This rule, which, if I understand it well, is equally applicable to all places and climates, has only need to be further confirmed by nature to lead to the most important results. If it is really founded on that basis, the author of the discovery (Mr. Arthur Young) whose fortunate exertions seem to embrace every part of rural economy, will have a right to applaud himself for having so essentially served the public. This rule, seconded by a judicious process in making, will be able in all cases, as it secures the choice of fruit, to give cider henceforwards a degree of excellence, which, without the development of this secret, it would have never been generally capable of attaining.

There are but few wines held in such high estimation as cider of the best quality. Mr. Marshall, in his work already quoted, entitled "The Rural Economy of Gloucestershire," (vol. ii. p. 253,) mentions, that Mr. Bellamy, of the Priory, near Ross, Herefordshire, makes some of an excellent nature from

from the Hagloe crab. There are actually trees which produce this valuable fruit, to be sold by all our nurserymen. This is one of the cider varieties, which the English seem to value most.

With a view to be sure of my authority, I wrote to Mr. Bellamy himself; that worthy man, at the same time that he blended with his answer to a stranger, that obliging assability, which is the characteristic of true philanthropy, has given such solution to my questions, as leaves me no room to wish for any thing more. The following extract from his correspondence proves it. It may also be seen from this short sketch of his process for managing cider, that it plainly rests on the same grounds as that which I now venture to offer to the public.

"The Hagloe crab, (says Mr. Bellamy), which my grandfather raised, has very well succeeded in strong and sandy grounds, though better in the latter; but it does not now grow so well as it used to do in the counties of Hereford and Gloucester, the young trees lately grafted being subject to canker.* The situations most exposed to the sun suit it best. It does not acquire a considerable size; it is not high, but thick and bushy at top. It has a very fine appearance. Altogether, it cannot be considered as fruitful, though I have known instances in very good years, when it has bore plentifully enough. I am inclined to think, that it does not come to its perfection in less than twenty-five or thirty years. Its blossom is weak, and while it is young it produces but little. The apple has a mean appearance, is oblong, and about as big as the common crab, though a little bigger in favourable years. It is a late fruit, hardly fit to pull down before the end of November, and which should then be well gathered, and kept very dry. It is for the most part ready for grinding by Christmas. The colour of this apple is yellowish, and has often a few black spots. It is not pleasant to the taste, and is in some sort sour before it is fully ripe. Its rind is thick and tough; its pulp clear, rather dry and stringy, and it is full of seeds, which have nothing particular. I attribute the fragrance of the liquor produced from it, especially to the bigness of the core, perhaps modified by the thickness of the rind. The nature of its pulp requires a much greater quantity than is commonly put to make a given measure of cider. It should be quite ripe before grinding, and be particularly well ground. This latter circumstance is indispensable on account of the thickness of the rind, as I have said, and the bigness of the core. When the fruit is ground, it has a very deep colour, almost that of blood. The Hagloe crab by itself is excellent, and very good also when mixed with all the other good late

* In a former part of this work, I have indicated how to cure this disorder. By operating on a new variety, such as the Maglos crab, there would be so much the more chance of succeeding.

fruits, such as the woodcock, the redstreak, and that called Pawson. The liquor of this fruit is high-coloured, heady, fragrant, and of a substantial taste; but it depends a great deal on the making: it requires to be very much racked, the periods for which may be known from the inspection of the liquor, as in all other cases of the kind. Its fault is, that if it has failed to be duly racked and clarified, as soon as it was necessary, it gets harsh. My method has always been to prepare it in open vats, and to draw it off from the lees with a cock at the bottom, to prevent the pellicle from breaking, and to repeat the same process till it became clear. It must be lowered, and prevented from simmering after the first fermentation, as much as possible, and it allows this kind of management, without any diminution of its strength better than any cider I know. The lees must be well filtered at each racking, and what is extracted from them, be put with the other cider in the same vessel. It keeps better in bottles than in casks; as in the latter, it does not keep its fragrance so well as some other ciders, though it retains body for several years; but it preserves its perfect excellence in bottle as long as can be wished. I have no idea that it gets better for being kept a long time; it is very good in a year, and, perhaps, it is never better than at the end of a year and a half, or two years.

As to the price, it is sold from about 18*l.* to 20*l.* a pipe. I have known it, when it was very good, to sell as high as 4*s.* a gallon. My late uncle, of Chestmill, made some of it to such a perfection, that he was offered an equal quantity of port wine in exchange.

The following letter cannot fail of being extremely interesting to the Jersey grower.

St. Helier, January 10, 1801.

SIR;

In consequence of the conversation we lately had together on the subject of the cider which is made in this island, I take the liberty of communicating to you some particulars about a small quantity I made in 1788.

In the first place, I took care that the apples should be gathered on a very dry day; and then I had them put in a heap till they were quite ripe; when the time came for grinding them, I gave orders that no water should be mixed with them, except such as would be absolutely necessary for that process, which was strictly observed.

I had three hogsheads of cider which I left to work on the lees; after which I had it racked three times; and, in March, 1789; I put half a gallon of Coignac brandy into each hogshead, and soon after I had it bottled off. I had exactly sixty dozens, which I put on board the Peggy, (Captain Thomas Bandinel), and sent them to the Bay of Honduras.

The heat of the climate made a great many of the bottles fly during the passage. The remainder, (the bottles included), was sold as mountain wine, at the rate of forty-three shillings a dozen, [WORCESTERSHIRE.] R & C dozen,

dozen. Thus, by estimating each hogshead at only twenty-two dozens, it would have risen to the enormous sum of 47l. 6s.

It must be allowed, that at the time that I sent it, it was cider of a very superior quality; but if the same attention was generally paid in making it, I am persuaded that this island could dispute the pre-eminence for that article with any country whatever, and perhaps it might even have the advantage.

I have the honour to be respectfully, SIR,

Your most humble

And most obedient servant,

THOMAS MALLET.

*To the Rev. Mr. Le Couteur,
Rector of Granville, Jersey.*

Cider deserves the particular attention of every person who may be desirous of taking care of his health. It is diuretic, light, and refreshing, and suits most stomachs; it facilitates digestion, and melts, by its beneficent acid, those humours which often resist every other beverage. An excess of it, however injurious to health, is very far from being attended with such serious consequences as that of spirituous liquors.

The principles which the author has explained in the course of this work, have been successful with him during a practice of almost thirty years. They are free from all expensive processes, and are accommodated to the means of individuals in the least easy circumstances. He has, therefore, endeavoured to develope them, with the hope that they will contribute to replace with a wholesome and agreeable liquor, a drink which but too often is insalubrious and disgusting; procure an advantageous market, spread a liberal emulation among his fellow-citizens; and, lastly, fix on the basis of a judicious economy, as much as can be done by a produce of this nature, the ease and the prosperity of the inhabitants of this island.

OFFICIAL

OFFICIAL DOCUMENTS

Concerning the Exportation of Cider.

THE annexed documents confirm the privilege of exporting our ciders to England, free of the duties levied on that which comes from foreign countries. It is advisable, that persons, who are engaged in this trade, with a view to prevent trouble, should supply themselves with a copy of them, attested by some magistrate, and authenticated under the seal of the Island.

Extract from the Register of the States of the Island of Jersey.

COUNCIL OFFICE.

Whitehall, 26th April, 1797.

SIR,

The Lords of the Committee of Council for the Affairs of Jersey and Guernsey, having lately received a Report from the Lords Commissioners of his Majesty's Treasury, upon a Petition of the States of the Island of Jersey, dated 4th April, 1796, (which their Lordships had thought proper to refer to the consideration of the Lords Commissioners of his Majesty's Treasury) respecting the importation of goods, wares, and merchandize, of the growth, produce, and manufacture, of the said island, and complaining particularly that the importation from Jersey of cider of the growth of the said island into the ports of this kingdom, free of duty, had, in some late instances, been objected to, by the officers of excise, &c. &c.

I have

I have it in command from their Lordships to transmit to you a Copy of the said Report of the said Lords Commissioners of Excise, upon the subject matter of the said Petition, and particularly with relation to the article of Cider imported from Jersey into the ports of this kingdom; and I am to acquaint you, that, it appearing to the Lords of the Committee, that the subject matter of the said Petition being entirely matter of regulation, and therefore more proper to the determination of the Lords Commissioners of the Treasury than of the Lords of Council, their Lordships have signified their opinion to the said Lords Commissioners, that directions should be given from the Treasury to the Commissioners of Excise, to adopt and carry into execution the several regulations with respect to the article of Cider imported from Jersey, which are mentioned in the said Report of the Lords Commissioners of the Treasury, extending the same to Cider made from tythe-fruit, in case the Commissioners of Excise shall have no objection to such extension.

I am, SIR,
Your most obedient humble servant,
(Signed) STEPH. GOT TRELL.

Lient. Bailly, of Jersey.

To the Right Honorable the Lords of the Committee of Council for the Affairs of Guernsey and Jersey.

MAY IT PLEASE YOUR LORDSHIPS,

We, having taken into consideration the Order in Council of the 8th June, 1796, referring to this Board a Petition of the States of the Island of Jersey, together with the several papers thereunto subjoined, respecting the importation of goods, wares, and merchandises, of the growth, produce, and manufacture, of the said Island, for our opinion, what it may be advisable to do therein, have taken the said Petition and papers into our consideration, having referred the same to the consideration of the Commissioners of his Majesty's Customs and Excise, and considered the opinions stated by them respectively thereupon. We find that the redress sought for, does not come under the cognizance of the former Board; but it appears, by the Report of the Commissioners of Excise, that the inhabitants of the Islands of Jersey, Guernsey, Sark, and Alderney, are permitted by the Act of 3d George I. cap. 4th. to import into this kingdom, goods of the growth of the said Islands,

Islands, on payment only of the same duties of excise, or other duties, which are payable for the like goods of the produce of Great Britain, which has been constantly permitted with regard to excisable commodities so imported, and the Commissioners see no reason for enlarging that indulgence. The papers transmitted, particularly relate to the article of Cider, the excise import duties on which are 17l. 16s. 6d. per ton; no more, however, has been paid for cider from Jersey, as appears, both by the reports of their officers, and the memorial itself, 18s. 7d. per hogshead in one case, the sum chargeable in this kingdom on the sale of bought cider; or 19s. 2d. in another, the sum payable by the British factor or agent, receiving it to sell or dispose of. The British grower selling in quantities of twenty gallons or upwards, is not chargeable with any duty, and none has been required of the importers from Jersey, when such evidence has been produced as is always given by the British grower, which evidence is the affidavit either of the maker or of his son (the Commissioners of Excise not admitting any more remote agent), stating it to be from fruit of the father's own growth, not mixed with any bought fruit whatever. In the case of the inhabitants of the before-mentioned islands, the Commissioners are not aware of the difficulties the grower may be put to; and, therefore, do not object to cider being admitted from thence, free of duty on importation, provided that in addition to the usual certificate of the Governor or Lieutenant-Governor, and affidavit, before the magistrates of the island of its being the produce of such island, an affidavit be also delivered to the Collector, or other proper officers of Excise, made by the grower before the same magistrates, testifying that such cider was made from fruit of his own, and of the growth of the lands belonging to, or occupied by himself, or in the case of cider made by any minister of a parish, that it is either from fruit of his own growth, or from tythe-fruit belonging to him as minister of some parish, and not from any bought fruit, or any mixture therewith, and that the said cider continues to be his property, and is intended to be imported into Great Britain for him, or on his own account only; and also provided the person entering it here, on the importation thereof, likewise shall make oath, that it is still the property of the aforesaid grower to the best of his knowledge and belief. But the Commissioners observe, that though the grower himself will, in this case, be free from duty, the cider imported, if consigned to any agent for the purpose of sale, must, like all British cider made in one place and sold in another, always be liable to the factor's duty of 19s. 2d. per hogshead, payable by the person who receives it to sell or dispose of. And the said Commissioners further report, that any exemption from duty, or any further indulgence to the grower of cider in Jersey, would be obviously giving him a preference to the British grower.

We

e e 3

We, therefore report, that it may be proper to adopt the regulations proposed by the said Commissioners of Excise.
All which is nevertheless submitted to your Lordships.

J. TH. TOWNSHEND,
J. SMYTH.
S. DOUGLAS.

Whitehall, Treasury Chambers,
28th March, 1797.

(A true Copy, signed)

JOHN DE VVILLE, Clerk,

ERRATA.

Page 18, and elsewhere, I have mistook the orthography of the name of the Flingsley family, instead of *Littleton* it is Lyttelton.

Page 21, l. 20, and elsewhere, for —— *Smith, Esq.* Erdiston, read now Sir William Smith, Bart.

P. 37, l. 4, and 5, read *riuen to 60000*,

P. 37, l. 18, for *many*, read *vary*.

P. 45, l. 17, for *string*, read *swing*.

P. 46, l. 20, for *machine*, read *man*.

P. 49, l. 20, for *Wibampton*, read *Wolverhampton*.

P. 59, l. the last, for *is*, read *iron*.

P. 62, l. 27, for *m*, read *iron*.

P. 66, l. 32, for *tying*, read *tying*, (i. e.) *tethering*.

P. 80, l. 5, for *only one*, read *the only one*.

P. 80, l. 30, for *is far the best*, read *is so far the best*.

P. 90, l. 12, for *nine months*, read *nine inches*.

P. 196, l. 14, for *ploughing*, read *planting*.

P. 213, l. 20, for *sited*, read *silted*.

P. 226, l. 7, for *promising*, read *premising*.

P. 232, l. 3, for *6s.* read *6d.* per cwt.

P. 254, l. 32, read *troughs c. c. d. b. i. section, &c.*

P. 261, l. 5, for *Pomeroy*, read *Partridge*, Mr. Knight's Steward.

P. 306, l. 10, for *white-barel*, read *witch-hazel*.

P. 307, l. 23, for *Bewern*, read *Bevere*.

P. 316, l. 1, *Birmingham* is a mistake and should be crossed out.

The town spelt *Broomsgrove*, should be *Bromsgrove*.

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.....	English.	Lentils.	Small.
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			Lucerne.

Lucerne.		
Mangel wurzel,	Turnip.	Red top.
Maw-seed.	Large yellow.
Medicago, various sorts.	Globe.
Millet. Red.	.....	White tankard.
..... White.	.....	Green ditto.
Mustard. Brown:	.....	Red top ditto.
	.....	Large Dutch.
Oats. Early Essex.	.....	True yellow Swedish, or ruta baga.
Dutch brew.	.....	White Swedish.
Tartarian.	Vetch.	Kidney.
Poland.	.....	Chickling.
Potatoe.	.....	Pale-flowered;
Flanders.	.....	Everlasting.
Caspian.	.....	Great wood.
Black.	.....	Six-flowered.
Parsley. Plain.	.....	Tufted.
Parsnip. Large thick.	.....	Bush.
Pea. Marlborough grey.	.....	Hoary.
.. Large grey roundival.	.....	Saintoin.
.. Early white.	.....	Red-flowered.
.. White boiling.	.....	Biennial.
.. Pearl.	.....	Bastard.
.. Blue Prussian.	.....	Broad-podded.
.. Maple.	.....	Rough.
Potatoes. Ox-noble.	.....	Single-flowered.
..... Late champion.	.....	Narbonne.
..... Large red.	.....	Flat-podded.
..... Nicholson seedling.	.....	Hairy ditto.
..... Bomb-shell.	.....	Narrow-leaved.
Rib-grass. Lamb's-tongue, or Up-right plantain.	.....	Streaked.
Rape, or coleseed.	.....	White-flowered.
Eye.	.....	White-seeded.
Sainfoin.	.....	Horse-shoe.
Sarideila	.....	Milk.
Tares. Spring.	.....	Liquorice.
.... Winter.	Weld.	
.... White.	Wheat.	Red Lammas.
.... Perennial.	.....	Common white.
.... Birdsfoot.	.....	White hedge.
Trefoil. Common, various sorts.	White Siberian.
.... Early stoned.	Egyptian.
Turnip. White Norfolk.	Sicilian.
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